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A Separation of Church and Growth? The Intersections of Seventh-Day Adventism and Economic Development in Puerto Rico

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The University of Southern Mississippi

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THE INTERSECTIONS OF SEVENTH-DAY ADVENTISM AND ECONOMIC DEVELOPMENT IN PUERTO RICO

by

Josefer Montes

Abstract of a Dissertation
Submitted to the Graduate School
of The University of Southern Mississippi
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy

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ABSTRACT

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This dissertation investigates the intersections of religion and economics, specifically the Puerto Rican economy and the Puerto Rico Seventh-day Adventist Church (SDA). Chapter II investigated the relationship between an economy that exports its currency and one that imports its currency by researching how United States monetary policy impacts the Puerto Rican economy. Through the perspective of the Optimal Currency Area (OCA) framework as posited by Mundell (1961) and employing a vector autoregression (VAR) model, the impact of U.S. monetary shocks was investigated by regressing those effects against Puerto Rican employment data. While the Puerto Rican business cycle generally follows that of the United States, asymmetric effects from U.S. monetary policy shocks on Puerto Rican employment are statistically significant and typically last over three years.

Chapter III investigated the intersections of religion and economic development by researching how members of the SDA Church in Puerto Rico believe that church membership has affected their lives. Using survey data and employing simple and multivariate regression models, the impact of Seventh-day Adventism was investigated through the attitudes and responses resultant of the survey. The United Nations Development Programme's Human Development Index (HDI) served as the theoretical

perspective. The regression models suggested that of the variables measured only commitment level has any significant affect on perceived economic development. Gender and previous religious affiliation had no effect, with education level, age and income level having minimal effect. These findings are similar to other studies regarding the influence of religiosity on economic outcomes.

Through the theoretical perspective of Azzi and Ehrenberg's (1975) economic model of religiosity, Chapter IV investigated the intersections of religion and economics. Regressing Puerto Rican macroeconomic data with Seventh-day Adventist Church in Puerto Rico growth and giving statistics will measure how the Puerto Rican economy influences Seventh-day Adventist growth and giving in Puerto Rico. Sales' (1972) research relating economic threat to authoritarian behaviors posits that an authoritarian denomination like the SDA church would be countercyclical in regards to church growth and macroeconomics. However, this chapter's models suggested an entirely different conclusion; the Seventh-day Adventist Church in Puerto Rico is procyclical.

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LIST OF ABBREVIATIONS

1. Add Health – National Longitudinal Study of Adolescent Health
2. A-E – Azzi and Ehrenberg
3. AHAA – Adolescent Health and Academic Achievement Study
4. AoG – Assembly of God
5. ARIMA – autoregressive integrated moving average
6. BEA – United States Bureau of Economic Analysis
7. BLS – United States Bureau of Labor Statistics
8. CEX – Consumer Expenditure Survey
9. CoG – Church of God
10. DNB - De Nederlandsche Bank
11. EU – European Union
12. FBO – Faith-based organization
13. GDP – Gross Domestic Product
14. GNI – Gross National Income
15. GNP – Gross National Product
16. gretl – Gnu Regression, Econometrics and Time-series Library
17. GSS – General Social Survey
18. HDI – Human Development Index
19. IRF – Impulse Response Function
20. LDS – Latter-day Saint
21. NAFTA – North American Free Trade Association
22. NGO – Non-governmental Association

23. NORC – National Opinion Research Center

24. OCA – Optimal Currency Area

25. RATS – Regression Analysis of Time Series

26. SDA – Seventh-day Adventist

27. UNDP – United Nations Development Programme

28. VAR – Vector Autoregression

CHAPTER 1

INTRODUCTION

Investigating the intersections of religion and economics, specifically the Puerto Rican economy and the Seventh-day Adventist (SDA) church in Puerto Rico, this dissertation will be outlined as follows. This first chapter will serve as an introduction to the research's ideas and themes.

The second chapter will research how United States monetary policy shocks impact the Puerto Rican economy. Through the perspective of the Optimal Currency Area (OCA) framework as posited by Mundell (1961), the impact of U.S. monetary shocks will be investigated by regressing those effects against Puerto Rican economic data.

The third chapter will use survey data to investigate how members of the Seventh-day Adventist (SDA) Church in Puerto Rico believe that church membership has affected their lives. This chapter investigates links between religion and economic development, through the attitudes and responses resultant of the survey. The United Nations Development Programme's Human Development Index (HDI) will serve as this chapter's theoretical perspective.

The fourth chapter completes the research on religion and economic development by combining the elements elucidated in the previous two chapters. By measuring how the Puerto Rican economy influences SDA membership growth and giving in Puerto Rico, this chapter will examine how directly the Puerto Rican economy affects the church's economy. Azzi and Ehrenberg (1975) offer the theoretical perspective for this chapter. The fifth and final chapter will close this dissertation by suggesting some conclusions and some additional research possibilities.

This dissertation reflects the current literature where researchers describe studies of economic attitudes and argue that religious beliefs and development are inextricably linked (White and Tiongco 1997). Guiso, Sapienza and Zingales (2003, 1) found that "on average, religious beliefs are associated with 'good' economic attitudes, where 'good' is defined as conducive to higher per capita income and growth" and "that [overall] Christian religions are more positively associated with attitudes conducive to economic growth." This finding is similar to Barro and McCleary's (2003, 779), where they found "causal influences from religion to economic growth" and that "stronger religious beliefs stimulate growth because they help sustain specific individuals that enhance productivity." Most recently, Traunmuller (2009) found evidence of a double positive effect of Protestantism, where Protestants tend to be more trusting and that a Protestant context increases trust, regardless of individual religious belief.

The subject of religion and economics far pre-dates the above-cited scholars. With its themes of the universal common good and global civil society, Thomas Aquinas' *De Regno (De Regimine Principum) ad Regem Cypri* (1267) and *Summa Theologica* (1265–72), where Aquinas argued for the Christian commitment to progress (Stark 2005), were antecedents to the economic concern with religion and development. Adam Smith, in *Theory of Moral Sentiments* (1759), wrote that religious beliefs provide strong incentives for individuals to follow moral structures that often support economic growth. He wrote that our conscience is something innate and that people are born with a moral sense that is not provided by laws or by rationality. This same "invisible hand," Smith would argue, also creates beneficial social patterns out of our economic actions. Smith extended economic reasoning to an analysis of religious behavior in his *Wealth of Nations* (1776).

Later Max Weber's *Die protestantische Ethik und der Geist des Kapitalismus* (1904) theorized that religion might be a significant positive or negative force on economic development. Weber argued that the Protestant Reformation paved the way for modern capitalism by highlighting the value of individual responsibility, personal diligence, approved risk-taking and financial self-improvement. Heaven and salvation, hell and damnation and other supernatural rewards are great motivators of behavior in this world (McCleary and Barro 2006). Thus a key principle in the Weberian ethos is that religious beliefs, though not necessarily participation in organized religion, are critical for economic outcomes. Weber viewed religiosity as an independent variable capable of influencing economic results (McCleary 2007) by promoting work ethic, honesty, trust and thrift.

With the principal forms of Protestantism descending from his ideas, John Calvin was vital to the Protestant Reformation zeitgeist (Belloc 1928; Tawney 1952; Hooker 1999). Historically positioned in the early stages of modern economic development, Calvin reflected on the Genesis account regarding human origins and noted that the Lord placed all of creation, including its wealth, in man's care, thus assigning human stewardship to economic matters. The Biblical archetype of *imago dei* (created in God's image) found in Genesis 1 suggests that man is capable of creating, allowing man to utilize God's abundance towards growing wealth. Along with this abundance came responsibility and a mandate for wise stewardship, which could help explain why for centuries after the reformer's death, wealth development occurred wherever Calvinists made their homes (Hall and Burton 2009). Calvinist thought also provided a theological basis for private

property, largely missing in other cultures (Stark 2005) and the Calvinist doctrines of thrift and hard work later influenced Adam Smith[1] (Skousen 2006).

Calvin believed that economic success and religious faith evidenced that an individual had been chosen for salvation, as opposed to the medieval church's suspicion of the economic motive and condemnation of commerce. Attitudes toward commerce began to change as "Calvinism endowed the life of economic enterprise with a new sanctification" (Tawney 1952, 37), by accepting a commercial civilization and providing a creed to the business and merchant class[2] (Nelson 2001). Protestant economic contribution, like the doctrine of man's duty to develop wealth, clergy support for capital markets, the belief that technological progress was a blessing, that long-term investments are not to be discouraged and thinking multigenerationally are often considered products of Calvinism (Belloc 1928; Stark 2005; Hall and Burton 2009). This stood in stark contrast to Luther's outlook on business enterprises as the "very essence to the kingdom of darkness" (Tawney 1952, 84) that saw no reason for the business classes in a Christian society.

Despite these histories and the existing literature, economic development theory and practice has typically avoided engagement with religious discourse and often discounted its role (Sweetman 1999, Harper 2000, Ver Beek 2000, Selinger 2004, Fox and Sandler 2005, Tomalin 2006). Wolfe (2006, 9) writes that, "For much of the postwar period, academic disciplines, including the social sciences, ignored religion, despite the fact that giants of social-scientific discovery such as Weber and Durkheim made the subject

[1] Smith was raised in a very Calvinistic Scotland.
[2] The groups where Calvinism first found support.

central to their understanding of the world …Perhaps because the modern academy is so secular, the role of religion in promoting Western capitalism has been underestimated."

Religion's role in the public discourse is increasingly recognized (Steensland et al. 2000). Whether through symbols, pedagogy, rituals, preaching or discussion, religions shape member's concrete views on a wide range of social issues, including economic, (Wald, Owen and Hill 1988; Welch et al. 1993) in ways that often transcend social class, educational attainment, or other sociological factors (Leege and Kellstedt 1993; Davis and Robinson 1996; DiMaggio, Evans and Bryson 1996; Green, Guth and Smidt 1996; Wald and Calhoun-Brown 2007). There is sufficient rationale for development theorists and economists to accept religion's role on economic systems and its relevance on economic development (Nelson 2001; Barro and McCleary 2003; Mangeloja 2005; McCleary and Barro 2006).

Not everyone agrees with the positive link between religion and economic development. Fanfani (1935) argued that all religion has a negative effect on development with Beed and Beed (1996) echoing that secular economics seem to contradict several essential Christian beliefs. Wallerstein (1980, 1989) thinks the religion and economics relationship is likely to be one in which economics is the cause and religion the effect. With religion no longer fulfilling any important social function in modern society (Harper 2000), Sanderson and Loucks assert (2004) that there is no reason to presume a causal connection between religion and economic development.

Such sentiments notwithstanding, this dissertation will add to the conversation on the potential links between religion and economic development by using economic metrics from Puerto Rico, United States monetary policy shocks, survey data from the Seventh-

day Adventist Church in Western Puerto Rico and growth and giving metrics from the SDA church in Puerto Rico. This broad analysis (macro-economic variables to regional economic variables and regional church statistics to individual member attitudes) will employ religion as both dependent and independent variable.

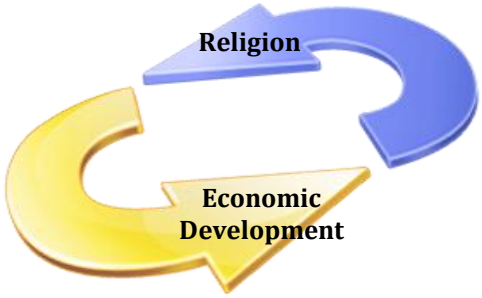

Figure 1. Two-way relationship between variables.

There are several academic attractions in choosing Puerto Rico as the geographical area under study. Puerto Rico's distinctive relationship with the United States offers unique dynamics that have highlighted both the positive and negative results of closer integration with the United States (Grusky 1996) and as an island it possesses an isolation that provides a natural research laboratory. With one of the most dynamic and open economies in the Caribbean region (Collins, Bosworth and Soto-Class 2006, Vega-Rosado 2006), Puerto Rican economic development invites investigation from United States economists (Baumol and Wolff 1996) and Puerto Rico is a case of legitimate interest to development scholarship (Padin 2003).

Despite being U.S. territory, rather than a sovereign country, Puerto Rican development policy has not been dictated by the colonial authority (Haggard 1990). Yet, the commonwealth, as the oldest colony in the world, has significant limitations to its sovereignty, whose laws have to be consistent with U.S. federal statutes (Suarez 2001). The Puerto Rican economy has features that differentiate it from the fifty states such as

location, commonwealth status, large public sector and a lower socio-economic status (Bram, Martinez and Steindel 2008). Rodriquez and Toledo (2007) outlined some of the principal characteristics of the Puerto Rican economy. Included in this list is the argument that American monetary policy determines Puerto Rican economic conditions, an argument that contributed to the genesis of this dissertation's second chapter.

While concluding that the Puerto Rican development model placed the island among the world's top performers during 1950–90, Baumol and Wolff (1996) placed Puerto Rico in an international context and argued that the Puerto Rican experience held valuable lessons for emerging economies. Sotomayor (2004) writes that Puerto Rico represents one of the earliest examples of development through integration to the world economy, thus should be of special interest.

Cultural and historical factors make Puerto Rico an interesting case in regards to the intersections of religion and economics. With their four hundred year shared history, language and religion, Spanish culture dominates Puerto Rican behavior. The Roman Catholic faith was exported to Puerto Rico with the 16th century conquest and became a Roman Catholic colony, producing cultural traditions penetrated by the Catholic faith. Thus religion, specifically Roman Catholicism, became the cultural support that came out of that historical background. Not unlike other countries founded by the Spanish empire, the religious values of the community are "deeply imbedded in the culture" and "it played a significant role in symbolizing the central values of the society" (Fitzpatrick 1987, 36).

While the first Protestant church in Puerto Rico was established in January 1873 with the consecration of an Anglican church in Ponce, the 1898 arrival of American troops brought Protestantism on a much wider scale and introduced a new dynamic (Vega 1993)

that paved the way for the SDA church in Puerto Rico[3]. David Trail, an American soldier and a Seventh-day Adventist, settled in Las Marias after the United States won the Spanish-American War. Trail wrote to the Seventh-day Adventist headquarters requesting that a missionary be sent to Puerto Rico and upon receiving his letter in 1901, SDA leadership sent Albert Fisher to Puerto Rico, officially beginning the island's SDA presence (Vega 1993). Today, with approximately 37,000 members, 300 churches, 12 high schools, two radio stations, two medical clinics, a university and a hospital, the Seventh-day Adventist church is present and active in Puerto Rico (Seventh-day Adventist Church Inter-American Division, 2009).

The SDA church, founded, organized and headquartered in the United States of America, has a worldwide network of churches, schools, colleges, hospitals, clinics, media centers and development offices (General Conference of Seventh-day Adventist, GCSDA, 2009). This global reach presents an attractive research opportunity. Doctrines that may influence economic development, including an emphasis on healthful living along with organizations that promote educational attainment add to the appeal.

SDA doctrines include a holistic aspect that includes not just traditional Christian beliefs, but also lifestyle teachings, recognized as the "Health Message." This component of the faith could have a positive impact on life expectancy through more healthful living.

The denomination's efforts have led to a global educational system that includes 7,600 schools, colleges and universities, with approximately 81,000 teachers and 1,500,000 students (GCSDA, 2008). The SDA school system is considered to be the

[3] The SDA church in Puerto Rico commemorated their 110th anniversary on April 11, 2008.

second-largest private school system in the world, second only to the Roman Catholic school system (Paulsen 2008). This focus on education is often vital to Adventism's missionary efforts.

The centralized form of church governance used by the SDA church generally eases access to many individual congregations and institutions, along with providing a central clearing house for church statistics such as membership, baptisms, tithe receipts and institutions. However, this community is best seen in the church's universally recognized (that is, among SDA members) 28 "Fundamental Beliefs" that has developed a community around familiar values, perspectives, practices and beliefs (Durkheim 1912/2001; Gustafsson 1997; Henslin 2002).

Among these Fundamental Beliefs is the doctrine of the "The Gift of Prophecy" (#18), which in Adventist cosmology was manifested in the ministry of Ellen G. White (1827-1915). According to SDA theology, she is considered the Lord's messenger and her writings are an authoritative source of truth (GCSDA 2010). Along with her husband, James and retired ship captain Joseph Bates, she was part of early Adventism's leading triumvate (Butler 1986) and she would become instrumental in the origins of a major American sect (Numbers 2008). Though not as recognized as Joseph Smith (Latter-day Saints), Ann Lee (Shakers), or Mary Baker Eddy (Christian Science) (Butler 1991), her writings number over 100 printed volumes and through the continuing efforts of the SDA church, she has become the most translated woman writer and the most translated American author (White Estate 2000).

Along with White's deliberations on sabbatarianism[4], eschatology[5], health reform, temperance, medicine, child nurture, education and religious liberty, her writings include numerous economic observations. When writing about the benefits of country living over city living, White wrote that the "sense of being owners of their own homes would inspire them with a strong desire for improvement ... their children would be educated to habits of industry and economy … they would feel that they are men, not slaves, and would be able to regain to a great degree their lost self-respect and moral independence" (White 1952, 373). Incapable of escaping Calvin, she wrote that "Religious duty and the highest human prudence in business lines must be co-mingled" (p. 381) and "Obedience to God's law is the great incentive to industry, economy, truthfulness, and just dealing" (489). In counsel to businessmen she prompted them to do their business in a manner that would glorify God and to be diligent in their work (White 1888) and that a Christian's business is a part of his service to God (White 1903).

The hypothesis that threat is one cause of increased authoritarianism is another academic attraction for choosing the Seventh-day Adventist Church. There is a general acceptance of the link between social, political or economic threat and authoritarianism (Sales 1973; Altemeyer 1988; McCann and Stewin 1990; Simonton 1990; Doty et al. 1991; Peterson et al. 1993; Stone and Smith 1993). Threatening circumstances lead to higher levels of attraction to authoritarianism (Fromm 1941; Rokeach 1960; Sanford 1966; Wilkinson 1972), with relatively authoritarian organizations becoming increasingly attractive.

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[4] The observance of Saturday as the Sabbath day of rest.
[5] The branch of theology concerned with the study of last-day events.

From this theoretical foundation, Sales (1972) investigated the rate of conversions to authoritarian churches and to nonauthoritarian churches during economically threatening years. While it is a common notion that there is a general trend toward religion in economically threatening times (McCann 1999; Vitello 2008; Anderson 2009; Ferguson 2009), Sales found that only churches with relatively authoritarian traits become more appealing during these times. Specifically, Sales' (1972) research related contemporaneous economic threat to authoritarian behaviors by finding that difficult economic conditions increase conversion rates to authoritarian churches, while better economic times increase conversion rates to nonauthoritarian churches. In his work, Sales concentrated on eight Christian denominations, which he classified as authorization and nonauthoritarian as outlined below:

Authoritarian

- Church of Jesus Christ of Latter-day Saints
- Roman Catholic Church
- Seventh-day Adventist Church[6]
- Southern Baptist Convention

Nonauthoritarian

- Congregational Christian Church
- Northern Baptist Convention
- Presbyterian Church in the United States of America
- Protestant Episcopal Church

Sales' classification of the SDA Church as authoritarian has support. Photiadis and Schweiker (1970) outlined some characteristics of authoritarian organizations that can be applied to the SDA church, including a strongly conservative theology, an ethnocentric

[6] The SDA church showed the highest positive correlation between threat and conversions.

outlook and the risk of somewhat stern sanctions for apostasy. Kelley (1972) placed a number of denominations along a strictness gradient with eight churches classified as authoritarian, including the Seventh-day Adventists.

The Seventh-day Adventist Church has been classified as a fundamentalist church (Theobald 1985), that asks from their members financial commitments and behavioral restrictions (Iannaccone 1994; Finke and Stark 2001) and is centralized, hierarchial (Lawson 1998) and ultraconservative (Pita-Barros and Garoupa 2002), all of which are considered hallmarks of authoritarian churches. Additionally, while Steensland et al. (2000) have observed how evangelical denominations have sought separation from the broader culture, Bull (1990) writes that the SDA church has maintained an ideological and social distance from other Protestants, including other evangelicals. This anti-ecumenism approach can be viewed as ethnocentric.

Among the denominations outlined by Sales (1972), the Seventh-day Adventist and Latter-day Saints have comparable commitment expectations and hierarchal structures. They both have distinctive lifestyle doctrines, which include a health code that discourages coffee, tea, alcohol, and tobacco consumption. Both denominations call for members to tithe (literally ten percent of income) to the church along with additional contributions to other church activities. Additionally, there is an expectation that members observe a weekly day of worship and rest, or Sabbath, which for Adventists are Saturdays and typically Sundays for Mormons (Campbell and Monson 2007; GCSDA 2010).

With clear lines of authority and a centralized and hierarchial structure, both churches are organized similar to the Catholic Church; all three have a single recognized

headquarters and leader. Where the SDA church differs significantly from the other two is in the prophetic status of its leader. The LDS president is the apex of the organization, considered a prophet and entitled to receive divine instruction pertaining to the entire church. As Pope, the Bishop of Rome is considered the *Summus Pontifex* (Supreme Pontiff) and Successor of Saint Peter, who can invoke the Catholic dogma of Papal infallibility (Campbell and Monson 2007; The Seventh-day Adventist Church Website 2010; Holy See 2003). The president of the SDA church is afforded no such distinctions.

Building on the above-articulated categorizations, the denominations researched by Sales (1972) can be graphed as seen in Figure 2 along demand and hierarchy axes. The SDA and LDS churches are considered high in both demand and hierarchy, while most mainline Protestant denominations, low in both areas, would be positioned in the non-authoritarian quadrant. Thus studying the SDA church focuses this research in the High-demand/High-hierarchy quadrant of authoritarian church classifications.

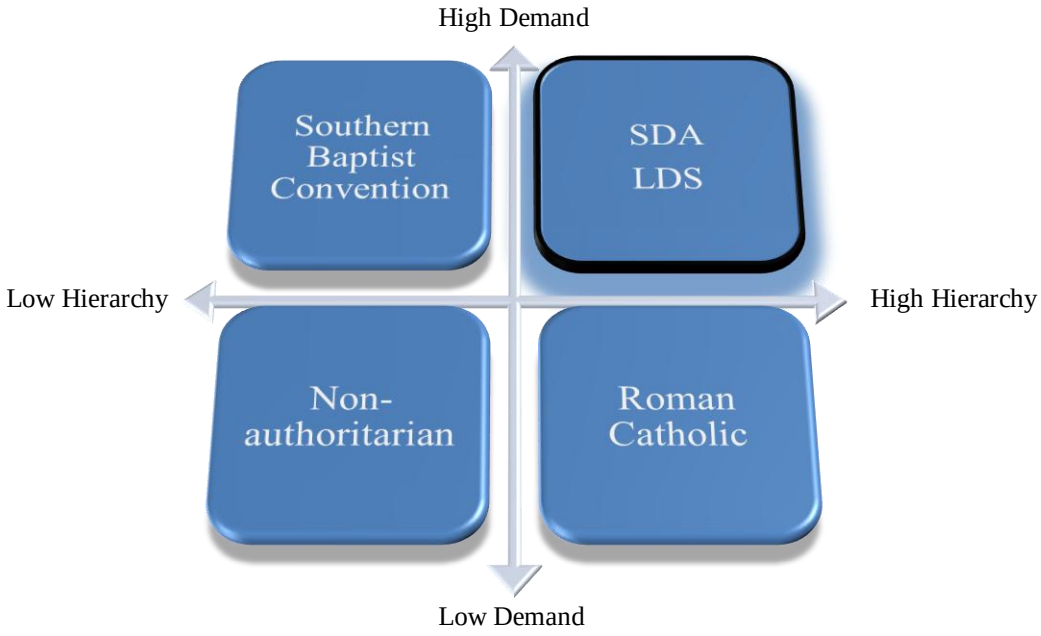

Figure 2. Authoritarian Denominational Classifications

As this research moves forward, there is one caveat, best articulated by McCann (1999, 335) "Authoritarian and non-authoritarian are used as convenient descriptive labels [since] … all churches may be said to be authoritarian at their core [;]… this dichotomous categorization is meant to be entirely descriptive rather than evaluative and does not imply relative superiority of the churches in either category."

Studying the SDA church has other academic attractions. Bull (1989, 177) contends, "Seventh-day Adventism is one of the most important religious movements native to the United States" and is the "most vital group to emerge from the debacle of the Great Disappointment." Yet, it is often treated as a Millerism sidebar, receiving scant scholarly attention. Also, Seventh-day Adventism is a "New World" faith that makes an interesting comparison to the "Old World" faith that is the backbone of the Puerto Rican culture –

Roman Catholicism. This empirical juxtaposition makes for a potentially more interesting comparison that merely using another "Old World" Protestant tradition.

The "patterns and practices of religious institutions are among the most important influences on people's lives" (Andersen and Taylor 2007, 337). Along with providing answers to questions of ultimate meaning, religion establishes values, moral proscriptions and behavioral norms (Furseth and Repstad 2006; Andersen and Taylor 2007). Through these norms and values, religion influences behavior (Bock, Cochran and Beeghley 1987) with conservative denominations, like the SDA church, producing particularly strong behavioral influences (Gay and Ellison 1993; Wellman 1999). This research will distill the literature's distinct philosophies and theories toward some closing suggestions regarding religion and economics.

Chapter II

Research Question: How do United States monetary shocks affect Puerto Rican employment?

Hypothesis: United States Monetary Shocks affect the Puerto Rican economy by causing Puerto Rican employment figures to fall.

Mundell (1961) pioneered the theory of the OCA, which he implicitly defined as a currency area where the benefits of adopting a single currency outweigh the costs of relinquishing the exchange rate as an internal adjustment instrument (International Monetary Fund 1997). Mundell's (1961) optimum currency area idea asked the following question – when is it beneficial to relinquish monetary sovereignty in favor of a common currency, thus comparing a nation's benefits and costs from participation in a currency union. The benefits are lower transaction costs, price stabilization, improved

resource allocation efficiency, and increased access to markets. However, a country's loss of sovereignty as to national monetary and exchange rate policies can be a significant cost.

According to OCA theory, the use of a single currency eliminates losses due to currency transactions and the requisite collection and processing of information. These resources now become available for other uses. OCA theory also argues that there are efficiency gains from eliminating relative price distortions generated by the transaction costs and the elimination of exchange rate uncertainties (International Monetary Fund 1997). Mundell's (1961) main conclusion was that an optimum currency area is not a nation, but rather a region characterized by price and wage flexibility, factor mobility, trade integration and similar external shocks.

Research to make Mundell's theory operational developed a list of criteria that countries should fulfill in order to qualify as candidates for a potentially successful currency union. The list of OCA criteria may be summarized by the following OCA "Decalogue" (Bayoumi [1994]; Bayoumi and Eichengreen [1997]; De Grauwe [2001]; Tavlas [1991, 1992]):

1. Factor mobility, and in particular labor mobility, across the members of the potential union.
2. High level of trade in goods across the members of the union.
3. Different (or diversified) composition of output and trade across countries.
4. Price and wage flexibility across members of the union.
5. Similar inflation rates across countries.
6. Financial markets should be integrated across countries.
7. Absence of "fiscal dominance" in the individual countries.

8. Low, and similar, levels of public sector debt in the different countries.
9. Similarity (or synchronization) of external shocks to which the different countries are exposed.
10. Political coordination across countries.

Data

Endogenous variables.

- U.S. Monetary Shocks, as measured by innovations to the U.S. Federal Funds Rate.
- Monthly, seasonally-adjusted non-farm employment in Puerto Rico from January 1980 to December 2008 as provided by the United States Department of Labor's Bureau of Labor Statistics (BLS), a source recommended by Miller and Salkind (2002). Data was acquired in February 2010.

Methods

A standard economic vector autoregression (VAR) models estimated the economic relationships. Sims (1980) advocates for VAR models as a theory-free technique to estimate economic relationships and provided a macroeconomic framework where each variable is expressed by its own lagged values, along with past values of the other variables. Subsequently, Lutkepohl (1991, 1999), Watson (1994) and Waggoner and Zha (1999) expanded the literature.

This VAR model tracked how any unexpected movements in the U.S. federal funds rate impacts the Puerto Rican economy by measuring the effect on Puerto Rican employment of a surprise increase or decrease in the Federal Funds rate. Or, more technically: what are the impulse responses of Puerto Rican employment to a monetary policy shock in a structural VAR? Utilizing multiple time series analysis, this VAR

provides a systematic way to measure the dynamics in U.S monetary. Specifically, it teased out the relationships between the U.S. Federal Funds Rate and money supplies and employment in Puerto Rico.

The model had restrictions on macrovariables, that is Puerto Rico is "too small to matter" in regards to influencing the general U.S. economy. However, the Puerto Rican economy can itself be influenced by the macroeconomic portion upon impact and afterwards. This approach provided realistic restrictions on the relationship between the U.S. and the Puerto Rican economy. Other using comparable VAR models include Barth and Ramey (2001), Davis and Haltiwanger (2001), Frantantoni and Schuh (2003), Lastrapes (2005, 2006), Irvine and Schuh (2005) and Beckworth (2010).

The estimation strategy adopted in this chapter is to estimate the following vector of endogenous variables by seemingly unrelated regressions (SUR) for Puerto Rico:

$$z = (y_{usa}, emp_{usa}, cpi, ppi, ffr, emp_{pr})'$$

where y_{usa} is national real economic activity measure for the United States, emp_{usa} is a United States employment measure, cpi is the commodity price index for the United States, ppi is the price level for the United States, ffr is the federal funds rate for the United States and emp_{pr} is a Puerto Rico employment measure. SUR estimation, a model developed by Zellner (1962), is used here because exogeneity restrictions are imposed by not allowing the Puerto Rico economy measure to enter the right-hand side of the macroeconomic variable equations.

This strategy is similar to the one outlined by Christiano, Eichenbaum and Evans (1999) where the federal funds rate responds to macroeconomic variables instantly while only affecting them with a lag. This "recursive approach" allows one to identify a

monetary policy shock as those movements in the federal funds rate not forecasted by the VAR. The impact of these shocks on the Puerto Rican economy can be seen once the model is estimated and the structural monetary policy shocks are identified.

Innovation accounting, which measures the variation explained by the "surprises" or "innovations" in other variables[7] (Gupta and Moazzami 1996) can be done to see the effect of these shocks on real economic activity. In particular, cumulative impulse response functions (IRFs), which trace responses to exogenous shocks, showed the response to a one standard deviation monetary policy shock. Monetary policy is considered to be generating asymmetric effects to the extent that there are statistically significant differences among these IRFs (Beckworth 2010).

The shocks, or the error term, are the closest thing to an independent variable in this model and are the "surprise" movements in the variables after accounting for their past values. Since it represents how much the actual interest rates deviate from the model's forecast, the forecast error can be thought of as the monetary "shock," and these shock/residuals are considered to be exogenous.

In this research, the VAR model involves six equations, which determine the endogenous variables:

On the macro level -

1. United States employment as a function of past values of a U.S. national real economic activity indicator (y_{usa}), past values of U.S. employment (emp_{usa}), past values of the U.S. price level (ppi), past values of the U.S. commodity price index (cpi) and past values of the U.S. Federal Funds Rate (ffr).

[7] In this case, the United States federal funds rate.

2. United States national real economic activity as a function of past values of a U.S. national real economic activity indicator (y_{usa}), past values of U.S. employment (emp_{usa}), past values of the U.S. price level (ppi), past values of the U.S. commodity price index (cpi) and past values of the U.S. Federal Funds Rate (ffr).
3. United States price level as a function of past values of a U.S. national real economic activity indicator (y_{usa}), past values of U.S. employment (emp_{usa}), past values of the U.S. price level (ppi), past values of the U.S. commodity price index (cpi) and past values of the U.S. Federal Funds Rate (ffr).
4. United States commodity prices as a function of past values of a U.S. national real economic activity indicator (y_{usa}), past values of U.S. employment (emp_{usa}), past values of the U.S. price level (ppi), past values of the U.S. commodity price index (cpi) and past values of the U.S. Federal Funds Rate (ffr).
5. United States Federal Funds rate as a function of past values of a U.S. national real economic activity indicator (y_{usa}), past values of U.S. employment (emp_{usa}), past values of the U.S. price level (ppi), past values of the U.S. commodity price index (cpi) and past values of the U.S. Federal Funds Rate (ffr).

On the regional level -

6. Puerto Rico employment as a function of past values of a U.S. national real economic activity indicator (y_{usa}), past values of U.S. employment (emp_{usa}), past values of the U.S. price level (ppi), past values of the U.S. commodity price index (cpi), past values of the U.S. Federal Funds Rate (ffr) and past values of PR employment (emp_{pr}).

There are two types of Vector Autoregression: reduced form and structural. The reduced form model is what gets estimated and is turned into a structural model by imposing theoretical restrictions. These restrictions help identify "structural shocks," in this case the monetary policy shock. There are two sets of restrictions applied here. First, there are the recursive restrictions mentioned above where the federal funds rate can respond to but not affect contemporaneously the other macroeconomic variables. These restrictions are consistent with standard macroeconomic theory, which says that monetary policy can only affect the real economy with a lag. Second, restrictions are also imposed such that the Puerto Rican economy can be affected by the U.S. economy but not vice versa.

In the reduced form VAR each variable is expressed as a linear function of its own past values along with the past values of the other variables in the analysis and an error term. Thus, each variable's current observation is contingent on its own lags along with the lags of the other variables in the VAR. When using VAR modeling the necessary number of lags is not readily apparent (McCarty and Schmidt 1997). There needs to be a sufficient number to ensure that the innovations are not autocorrelated, while avoiding excessive lags that diminish the model's precision. To determine how many lags are needed to eliminate serial correlation, the Ljung-Box Q Test (Ljung and Box 1978) was used.

All variables are in a monthly frequency. The Consumer Price Index, the Producer Price Index, the Federal Funds Rate and the Industrial Production Index come from the St. Louis Federal Reserve Bank's FRED database and the data was acquired in July 2010.

The chosen time period includes the recognized early-1980s structural break in monetary policy (Boivin and Giannoni 2006).

Chapter III

Research Question: Do Seventh-day Adventists in Puerto Rico perceive economic development benefits to their conversion?

Hypotheses:

- Seventh-day Adventists in Puerto Rico believe that conversion to the Seventh-day Adventist church has improved their economic development by encouraging more healthful practices.
- Seventh-day Adventists in Puerto Rico believe that conversion to the Seventh-day Adventist church has improved their economic development by encouraging further education.
- Seventh-day Adventists in Puerto Rico believe that conversion to the Seventh-day Adventist church has improved their economic development by increasing their standard of living.

This study aimed to examine the influence of religion on economic attitudes, in this case Seventh-day Adventists in Western Puerto Rico, through the analysis of survey results. Some recent scholarship using surveys similarly includes Francis, Lankshear and Jones (2000) using a survey intrument to examine the influence of the charismatic movement on Anglican churches. Cohen (2004) used Pew Global Attitudes Project survey data to explore the connection between economic perceptions and leader approval. Using data from the General Social Survey, Gruber (2004, 1) investigates the impact of charitable subsidies on religious participation. Daniels and Ruhr (2005) utilized

individual survey data from a national identity survey of U.S. residents to test the impact of religious affiliation on attitudes toward trade and immigration policies. Again using data from the General Social Survey, along with the U.S. Census data, Gruber (2005) investigates religious market structure by estimating the effects of religious participation on economic measures of well-being.

More recently, Gruber and Hungerman (2006) used data from the General Social Survey (GSS) on religious attendance to investigate the relationships between religious attendance and blue laws and data from the Consumer Expenditure Survey (CEX) to to investigate the relationships between religious contributions and blue laws. Using data from the Indonesia's The Hundred Villages Survey, Chen (2008) studied Koran study, Islamic school attendance and the Indonesian economic crisis of 1997-1998. Using data from the International Social Survey Program, Froese and Bader (2008) examined how images of God, as measured by God's perceived level of engagement and authority, relate to political ideology in Australia, France, Hungary, Ireland, Latvia, New Zealand, the Slovak Republic, and the United States.

This was not a study of religious economics – evaluating economic policies from a religious perspective - but research into how religion influences the behavior of individuals. Thus, Fox and Sandler's (2005) definition of religion, which focuses on five ways religion can influence society, helped guide this research. Of particular significance is the second principle, which states that religion is a belief system that influences behavior. This sentiment is similar to Garner's (1998) argument that religious belief may enhance the prospects for economic development by encouraging attitudes and activities that are conductive to development. This opinion is not uncommon, as

evidenced by Iannaccone's (1998) assertion that religious belief affects a wide range of behavioral outcomes, a finding he reached while evaluating approximately 200 papers on the economics of religion.

To help measure perceived economic development by SDA members in Western Puerto Rico, the theoretical framework of this chapter is the United Nations Development Programme's (UNDP) Human Development Index (HDI) and the three components it utilizes to measure economic development: income, longevity, and education (United Nations Development Programme 2009a).

Since 1990, the Human Development Reports have published the Human Development Index, a composite measure of human development, which has become one of the most widely discussed measures of the impact of economic development on well-being (Crafts 1999). It was felt that a summary measure is needed to supplement gross domestic product (GDP) per capita (Fukuda-Parr 2001), thus the UNDP launched the Human Development Index as a measure of the level and standard of living in cross-country comparisons to accompany the usual measures of gross national product (GNP) or gross domestic product (GDP), (Low and Aw 1997) which have traditionally had a singular influence on development economics. This is significant because while poverty can be alleviated at quite low income levels, high average incomes do not automatically safeguard the general populace from poverty (Streeten 2000). Quality of life can vary greatly between countries with similar levels of per-capita Gross National Product and real income (Anand and Sen 2000b). The Human Development Programme uses a comparison of Costa Rica and Iran as an example of the HDI's utility. While both countries have the same level of income per person, their HDI levels are vastly different

due to Costa Rica's much higher life expectancy and literacy rates (United Nations Development Programme 2009b). This is because the HDI endeavors to measure development in terms of health, education and other facets of life not measured by GDP.

The initial Human Development Report read that "The basic objective of development is … for people to enjoy long, healthy and creative lives … a simple truth often forgotten in the immediate concern with the accumulation of commodities and financial wealth" (United Nations Development Programme 1990, 9). It was also felt that "attention [solely] on GNP per capita had seen too few positive results" (Wherry, 2004, 158). A measure was needed to assess the development of a country and not just economic growth by not focusing exclusively on traditional economic measures but including individual outcomes (United Nations Development Programme 2009a). ul Haq (1995, 47) writes that the index "measure[s] at least a few more choices besides income and ~~to~~ reflect[s] them in a methodologically sound composite index."

Thus, the Human Development Index is a quality of life index of a country's citizens (Miller and Salkind 2002) and it seems to serve well as an approximation to collective human development in an economy (Sun 1997). There has been widespread use of the HDI as a measure of economic development (Crafts 1997b). The HDI has been designed to facilitate long-run comparisons and measures the distance covered from minimum to maximum development in terms of income, longevity, and education (Crafts 1999), and it is probably the most common standard measure of human development (Ivanova and Arcelus 1999). However, it is a summary measure of human development and not a comprehensive measure (United Nations Development Programme 2001).

Because they are fundamental, universal and measurable, the HDI focuses on income, longevity, and education (Fukuda-Parr 2001). Education often has a positive impact on standards of living and life expectancy (Mushkin 1962), and is important because the consensus is that human resource development has considerable influence on economic growth and development (World Bank 1993, 1995). Life expectancy is a recognized measure of development (Todaro and Smith 2009) and a decent living standard acknowledges that there are many basic needs dependent on economic circumstances. Income levels, particularly those close to poverty lines, is crucial information to monitor basic human capabilities (Anand and Sen 2000a).

Though the HDI may not represent each and every individual development factor, it does appear to reflect a good degree of collective human development (Sun 1997). Also, the HDI serves as a reminder that economic development is not merely raising output or income, but also enlarging human choices and enriching human lives (Low and Aw 1997).

The data for this research is built upon a large study of the SDA church, *AVANCE: A Vision for a New Mañana* by Ramírez-Johnson and Hernández (2003). *AVANCE* was conducted as a follow-up to the Valuegenesis study [8](Dudley and Gillespie 1992; Rice and Gillespie 1992) and focused on the unique needs and challenges facing the Hispanic Adventist Community in North America. *AVANCE's* main research question was: What variables affect the relationship between Adventist homes, schools, and churches and Hispanic youth and adult's commitment to the Christian faith? This relationship was examined within the context of acculturation, socioeconomic levels, and other variables

[8] A national mega-study of SDA youth in North America conducted by the SDA church.

affecting Hispanics in the United States. The study was also replicated in Puerto Rico, with 658 individuals participating.

The 30 to 90-minute survey included 302 questions and the results showed promise as a tool to evaluate economic development among the members of the SDA church in Western Puerto Rico. These types of questions help evaluate how members of the SDA church identify economic benefits from converting to Seventh-day Adventism. It was worth taking a closer and more detailed investigation at SDA membership and its influence on the economic development of its members in Puerto Rico. Since the purpose of this research was to investigate what perceived influence the SDA church has had on the development of those members in the island where the SDA church has been active, the three variables outlined by the HDI provided the variables to be measured.

Standard of living questions were used to create standard a "Standard of Living Index," with dietary and lifestyle choices as a proxy for life expectancy. This "Health Index" included questions on vegetarianism, alcohol consumption, tobacco use, etc. For the education variable, a question pertaining to further education was measured.

Data

The data was collected in a 1994 survey of Seventh-day Adventists in Western Puerto Rico gathered from the *AVANCE* study.

Independent Variables

The following demographic characteristics and the "Commitment Index" served as the independent variables, with scaling similar to the *AVANCE* study:

1. Gender - Q13: Are you male of female?

2. Education Level - Q16a (You): Indicate the highest level of education completed by each person.
3. Age - Q77*: How old are you?
4. Income - Q99: About how much money did your family or household earn last year?
5. Previous Religious Affiliation - Q181*: Before becoming an Adventist, with what denomination were you affiliated? In the survey, the results to this questions are outlined in Table 1.

Table 1

Previous Religious Affiliation of AVANCE Study Participants

Previous Religious Affiliation	Amount	Percent
Always Adventist	163	25.35%
Roman Catholic	277	43.08%
Baptist	6	0.93%
Pentecostal/AoG/CoG	26	4.04%
Presbyterian	22	3.42%
Methodist	9	1.40%
Jehovah's Witness	4	0.62%
No other church	119	18.51%
Other	17	2.64%
	643	100.00%

This analysis combined some of the above categories into four categories:

- Always Adventist
- Roman Catholic
- Other Protestant (Baptist, Pentecostal/AoG/CoG, Presbyterian, Methodist) – 9.79% combined
- No other church

Because their doctrines are viewed as heterodox to Protestant Christianity (Martin 1997), thus not particularly compatible in comparison, "Jehovah's Witness" was removed. Those responding "Other" were also be removed due to the difficulty in conjecturing what that may mean. This variable was scaled as follows:

(1) Always Adventist

(2) Roman Catholic

(3) Non-SDA Protestant

(4) No other church

6. "Commitment Index," which is similar to the process of religious self-categorization used by Fox and Tabory (2008) - For this variable, the following five questions was averaged. The closer the average is to 5, the higher presumed commitment to the SDA church.
    - Q65: I am proud of being a 7th Day Adventist
    - Q279: How do you rate your present relationship to the church?
    - Q291: I could not see myself leaving the SDA church

Dependent Variables

Though religious beliefs and religious service attendance are both recognized measures of religiosity (Andersen and Taylor 2007), to avoid potential circularity problems among the independent and dependent variables, questions that may hold a doctrinal component were be used. Instead, the dependent variables focused on how Adventism has affected member's life through questions that parallel the variables outlined by the HDI.

Along with paralleling the HDI, these indices and questions echo Stark and Glock's (1968) five dimensions of religious commitment by focusing on the "consequential dimension" of Seventh-day Adventism. Stark and Glocks's five dimensions are:

1. The Belief Dimension that emphasizes what a person believes, not just that s/he believes.
2. The Religious Practice Dimension includes ritual and devotion. In Christianity rituals include church services, baptisms, and communion, while devotion includes private prayers and Scripture reading.
3. The Experience Dimension deals with subjective religious experiences.
4. The Knowledge Dimension constitutes the knowledge that member are expected to have about doctrine, theology, and religious texts.
5. The Consequential Dimension includes the effects that religion has in a member's life.

The following two indices and a question regarding education served as the dependent variables, with scaling similar to the *AVANCE* study:

"Health Index" - For this variable, the following five questions were averaged. The closer the average is to 5, the higher presumed adherence to the SDA health message.

1. As an Adventist, how much do you agree or disagree with the following practices?
    - Q126: One should not use tobacco
    - Q127: One should not drink beer or liquor
    - Q134: One should not eat "unclean" meats
    - Q135: One should be a vegetarian

- Q139: One should exercise daily
- Q142: One should not use drinks that contain caffeine

"Standard of Living Index" - For this variable, the following five questions were averaged. The closer the average is to 5, the higher the perceived economic benefits from being an SDA.

1. Q296*: Since you conversion to Adventism, are you likely to be economically better or worse off?
2. Q300*: My money doesn't seem to go far enough since becoming Adventist
3. Q301*: I have a better job now that I am an Adventist

"Education" – For this variable Question 299* reading "I have been motivated to further my education since becoming an Adventist" was used. The closer that answer is to 5, the higher the perceived educational benefits from being an SDA.

* = Modified from the original scaling in the *AVANCE* study

Methods

Based on the *AVANCE* study's results, descriptive statistics and multivariate regression equations were estimated to determine the association of demographic, socio-economic and religious characteristics, with the perceived benefits of Seventh-day Adventism as measured through economic development factors. The dependent variables utilized in this analysis, perceptions of economic development, based on the United Nation's Human Development Index, investigated how SDA members in Western Puerto Rico view the benefits of membership. The independent variables included demographic, socio-economic and religious factors. Table 2 below presents the variables with their scaling. Recent works using similar methods in the analysis of survey data includes

Riegle-Crumb and Callahan (2009), Lambert et al. (2010), Aabo, Audunson and Varheim (2010) and Lavariega Monforti and Sanchez (2010).

Various indices were used as independent and dependent variables in the multivariate analysis equations. Based on a categorization of the questions from the survey, three indices were constructed:

1. Commitment Index (Independent Variable), based on affiliation and attachment questions, aims to measure the level of commitment to the SDA church.
2. The Health Index (Dependent Variable), based on questions regarding various tenets of the SDA health message, aims to measure adherence to those parts of the SDA orthodoxy that suggests a longer life expectancy (Fraser 2003; Montgomery et al. 2007).
3. The Standard of Living Index (Dependent Variable), based on questions concerning employment and personal finances, aims to measure whether or not SDAs in Puerto Rico believe that conversion to Adventism has been financially beneficial.

Simple regression models estimated the association between demographic, socio-economic and religions variables and perceptions of economic development. This analysis identified to what degree SDAs in Western Puerto Rico believe that their religiosity has impacted their economic development. Some examples are outlined below:

- Analysis - Sample 1: Gender. Multivariable regressions are used to understand how gender influences Adventist perceptions of the benefits of membership as

measured by the Health Index, the Standard of Living Index and Education variables.

- Analysis - Sample 2: Education Level. Simple regressions are used to understand how education levels influences Adventist perceptions of the benefits of membership as measured by the Health Index, the Standard of Living Index and Education variables.

Table 2

Variables with scaling

Measure	Description
Independent Variables	
Gender	1= Male 0= Female
Education Level	1= No formal school 2= Grade school 3= High school 4= Some college 5= College graduate 6= Master's degree 7= Postgraduate
Age	1= 18-25 2= 26-33 3= 34-41 4= 42-49 5= 50-57 6= 58-65 7= 66+

Table 2 (Continued).

Measure	Description
Income	1= < than $5,000 2= $5,000 - $9,999 3= $10,000 - $14,999 4= $15,000 - $24,999 5= $25,000 – $34,999 6= $35,000 - $49,999 7= $50,000 - $74,999 8= $75,000 +
Previous Religions Affiliation	
Always Adventist	1= Always Adventist 0= Not always Adventist
Previously Catholic	1= Previously Catholic 0= Not previously Catholic
Non-SDA Protestant	1= Previously Non-SDA Protestant 0= Not previously Non-SDA Protestant
No other church	1= Previously no other church 0= Not previously no other church
Independent & Dependent Variable	
Commitment Index	
Proud of Being an SDA	1= Strongly disagree 2= Disagree 3= I'm not sure 4= Agree 5= Strongly agree
Relationship with Church	1= Very weak 2= Lukewarm 3= Average 4= Relatively strong 5= Very strong

Table 2 (Continued).

Measure	Description
I could not see myself leaving the SDA church	1= Strongly disagree 2= Disagree 3= I'm not sure 4= Agree 5= Strongly agree
Dependent Variables	
Health Index	
One should not use tobacco One should not drink beer or liquor One should not eat "unclean" meats One should be a vegetarian One should exercise daily One should not use drinks that contain caffeine	1= Not at all strictly 2= Somewhat strictly 3= I'm not sure 4= Quite strictly 5= Very strictly
Standard of Living Index	
Since conversion to SDA, are you better off?	1= Much worse 2= Little worse 3= Same 4= Little better 5= Much better
Money does not goes as far since becoming SDA	1= Strongly agree 2= Agree 3= Not sure 4= Disagree 5= Strongly disagree
Better job since becoming SDA	1= Strongly disagree 2= Disagree 3= Not sure 4= Agree 5= Strongly agree

Table 2 (Continued).

Measure	Description
Education	
Motivated to further my education since SDA	1= Strongly disagree 2= Disagree 3= Not sure 4= Agree 5= Strongly agree
Development Index	
A summary of Health Index, Standard of Living Index and Education - the closer to five, the higher the perceived economic development benefits of Adventism	

Chapter IV

Research Question: How does the Puerto Rican economy impact growth and giving in the Seventh-day Adventist church in Puerto Rico?

Hypothesis

1. Growth, as measured by membership, in the Seventh-day Adventist Church in Puerto Rico remains unaffected by economic downturns in Puerto Rico.
2. Giving, as measured by per capita and total tithe giving, in the Seventh-day Adventist Church in Puerto Rico is adversely affected by economic downturns in Puerto Rico.

"Very often in times of financial crisis when banks fail and our trust in money diminishes, you'll see a religious revival," states Ferguson (2009, n.p.), a view shared by many religious leaders that believe that religiosity is influenced by the business cycle (Vitello 2008; Anderson 2009). Recently, Lashinsky and Kowitt (2008) reported that St Bartholomew's Episcopal Church in New York City, had a 10% increase in attendance

from the fall of 2007 to the fall of 2008. Using images from the Wall Street debacle as a draw, St. Bart's offered an eight-week refresher course on faith. Also in 2008, Trinity Church on Wall Street has tripled attendance at its lunchtime services from the summer to the fall. Weiss (2008, 1) writes synagogue attendance in New York City has experienced a sudden jump, "For Temple Israel and several other synagogues in the New York metropolitan area, the latest crises on Wall Street have infiltrated their halls." This paper adds to this dialogue by providing an empirical look at the relationship between the business cycle and religiosity specifically, the Puerto Rican economic cycle and growth and giving in the Seventh-day Adventist (SDA) church in Puerto Rico.

While the religion and economics connections have not been the topic of much scholarly analysis (Pita Barros and Garoupa 2002), there is empirical inspiration for this research. Sales (1972) investigated the effects of economic conditions on the annual conversion rates of eight denominations during the 1920s and 30s. McCann (1999) looks at membership growth rates denominations for the decades 1955-1964, 1965-1974, and 1975-1984, during what the author characterized as "threatening times." By using data over three decades, Gruber (2004) investigated the impact of charitable subsidies on religious participation as measured by attendance at religious services. However, it was Azzi and Ehrenberg (1975) that developed the first economic model of religiosity investigating the links between changing macroeconomic conditions and religious participation.

Azzi and Ehrenberg (1975) focused on church membership and the frequency of church attendance. In it, they attempted to explain household allocation of time given to religious activities, while taking religious beliefs as predetermined. It was the first

systematic attempt to study participation in religious activities through the rational-choice approach to the demand for religion. It was the starting point for the most recent literature on the economic analysis of religion and pioneered the modern economics of religion (Iannaccone 1998; Ekelund, Hebert and Tollison 2002; Pita Barros and Garoupa 2002; McCleary and Barro 2006).

The A-E model (Iannaccone 1998) analyzed how time was spent in religious activity, with a hypothesis that individuals invest time in religious activities to maximize satisfaction from consumption of all commodities, including salvation after death (Redman 1980). Thus, they primarily concerned the research with the "salvation motive" – where expected afterlife consumption relates to an individual's participation in church–related activities. That religious participation and religious giving are substitutes in the production of afterlife consumption is one of this model's key assumptions, thus implying that changing opportunity costs of religious participation over the business cycle are offset by changes in religious giving (Beckworth 2009).

Iannaccone (1998) wrote that psychology's, anthropology's, and sociology's accepted paradigms of religion has categorized religion as an "irrational calculus," thus aiding in the slow start of the economics of religion. However, since its writing, many economists have added to Azzi and Ehrenberg's (1975) model, as this chapter will endeavor to do.

Data

Independent variables. Puerto Rico Economic Data as provided by the Junta de Planificación de Puerto Rico (Puerto Rico Planning Board): Puerto Rico population and average family income from 1947-2008. The data was acquired in September/October 2009. Puerto Rico Economic Data as provided by the World Bank: Per capita Gross

Domestic Product from 1960-2001. The data was acquired in September/October 2009. Puerto Rico Economic Data as provided by the United States Department of Labor's Bureau of Labor Statistics: Unemployment from 1980-2008. The data was acquired in September/October 2009.

Dependent variables. Puerto Rico Seventh-day Adventist Church data as provided by the General Conference of Seventh-day Adventist Annual Reports 1931-2007: Membership, baptism, tithe and tithe/capita. The data was acquired in September/October 2009.

Methods

This research compiled Puerto Rico country-level indicators of Seventh-day Adventist Church membership, baptisms, tithe and tithe/capita, Puerto Rico population and average family income, Puerto Rico Per capita Gross Domestic Product and Puerto Rico Unemployment. Data sources were the General Conference of Seventh-day Adventist Annual Reports, Junta de Planificación de Puerto, the World Bank, and the United States Department of Labor's Bureau of Labor Statistics. All data, except that provided by the Junta de Planificación de Puerto Rico, was found through the respective organization's Website.

Correlation and basic regression analysis were employed to examine the associations between Puerto Rican economic indicators and SDA church growth and giving metrics. To make quantitative measurements of this potential relationship, basic regressions were run regressing current and lagged economic variables on measures of church growth and giving. Since the SDA church data is only available at an annual frequency, all the

regressions were estimated using use annual data. Also, to avoid unit root problems, all variables were turned into growth rates. Some examples are outlined below:

- Regression Analysis - Sample 1: This analysis examines baptisms in Puerto Rican Seventh-day churches in relation to Puerto Rican Per Capita Income and Per Capita Gross Domestic Product – recognized measures of macroeconomic activity. Sales (1972) concluded that during economically threatening years the rate of conversions to authoritarian churches increased, and the rate of conversions to nonauthoritarian churches decreased. Thus, only churches with certain qualities become more attractive during threatening times, whereas other churches lose their appeal – findings similarly echoed by McCann (1999). Sales categorized the SDA church as authoritarian, thus this analysis of SDA church baptisms is an extension of Sales' conclusion, and it is expected that changes in SDA membership should reflect economic-driven changes in religious participation.
- Regression Analysis - Sample 2: This analysis examines Per Capita Tithing in Puerto Rican Seventh-day churches in relation to Puerto Rican Per Capita Income and Per Capita Gross Domestic Product. Though considered very approximate, the use of tithe to estimate economic activity has significant precedence (Ladurie and Goy 1982; Kain and Oliver 1995; Newland 2002; Dodds 2004, 2007). Dahl and Ransom (1999) observed how the definition of income in regards to tithing depends on an individual's religious and financial incentives through surveying 1,200 members of the Mormon Church and found little evidence that an individual's financial situation influences beliefs regarding titheable income.

Based on their findings, it is expected that changes in SDA tithing should not directly reflect macroeconomic changes.

As alluded to above, making the comparisons in current dollars presents the challenge that all of the metrics measured trend steadily upward, as can be seen in Figures 3-5.

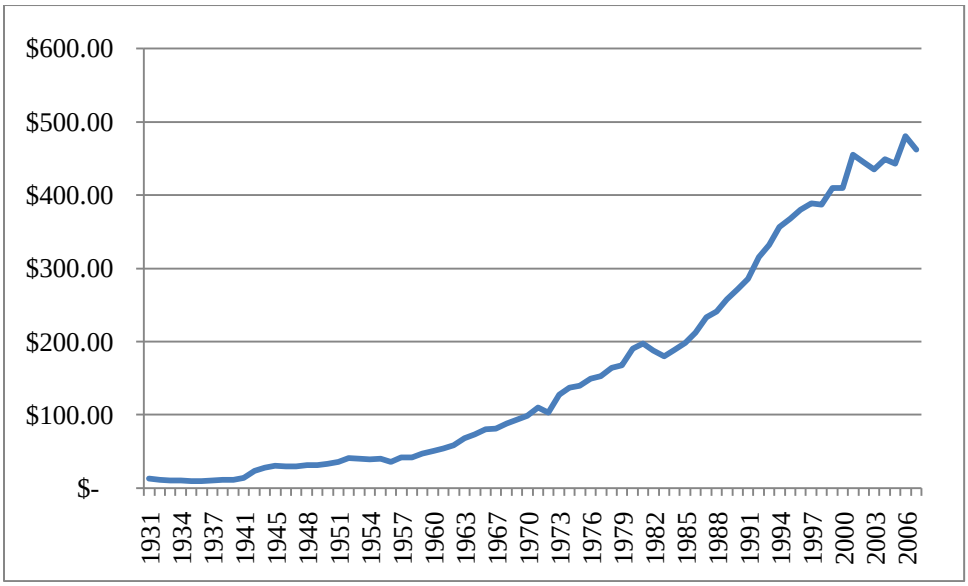

Figure 3[9]. Puerto Rico Per Capita Tithe for SDA Church.

[9] Unless otherwise noted, tables and charts are produced by author using Microsoft Excel

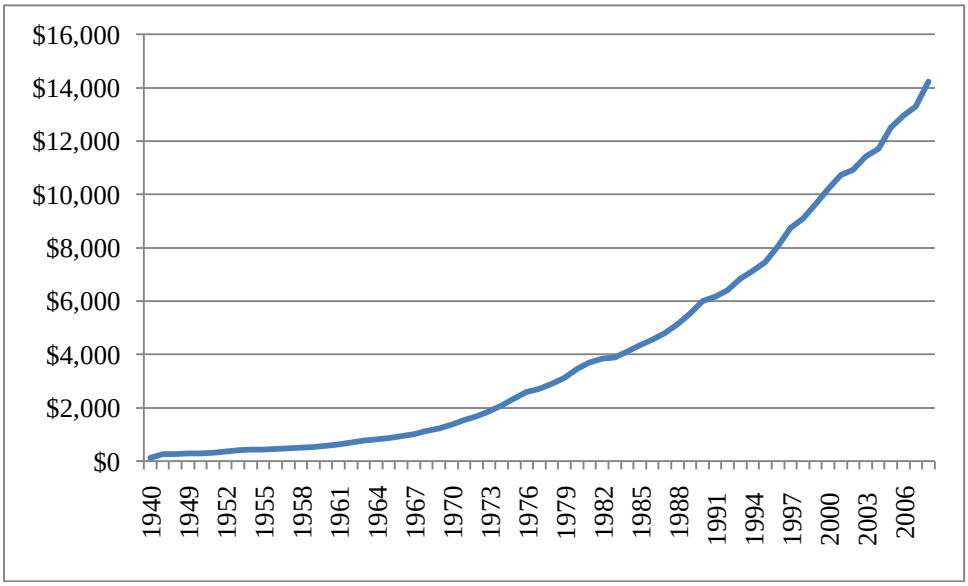

Figure 4. Puerto Rico Per Capita Personal Income.

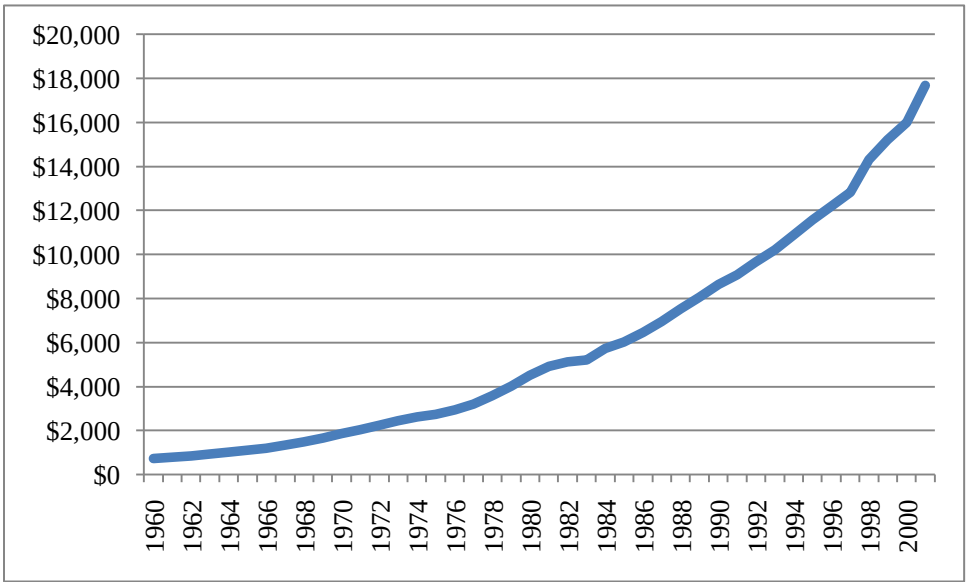

Figure 5. Puerto Rico Per Capita Gross Domestic Product.

To make comparisons more uniform, the data was used as follows:

- For the annual church giving metrics the percentage changes from year to year were calculated rather than using total changes. This procedure resulted in church giving percent change data for 73 years between 1932 and 2007.
- For the Puerto Rican per capita income the percentage changes from year to year were calculated rather than using total changes. This procedure resulted in income percent change data for 61 years between 1947 and 2008.
- For the Puerto Rico per capita GDP the percentage changes from year to year were calculated rather than using total changes. This procedure resulted in GDP percent change data for 41 years between 1960 and 2001.

Those charts are as follows, see Figures 6-8:

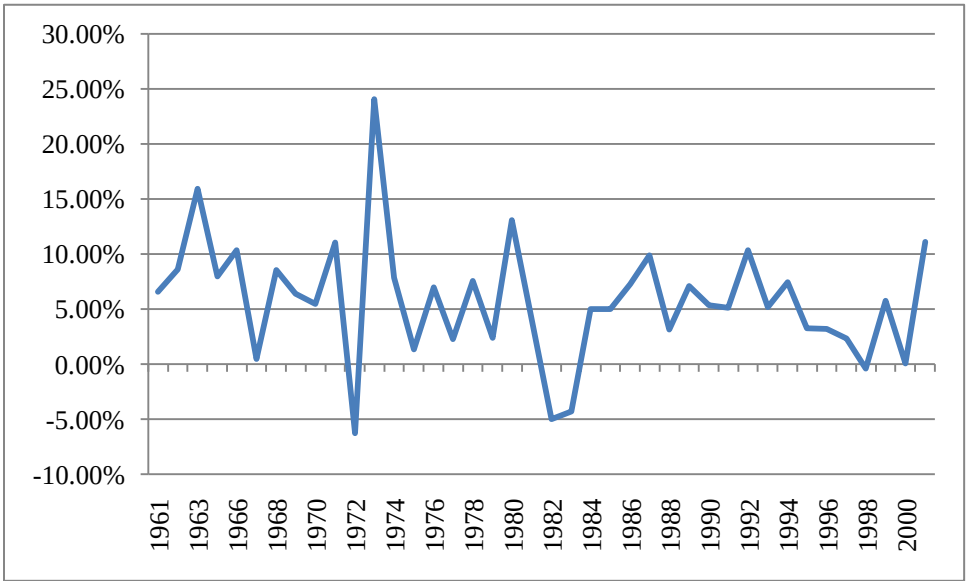

Figure 6. Per Capita Tithe Percent (PCT) Change for SDA Church in Puerto Rico.

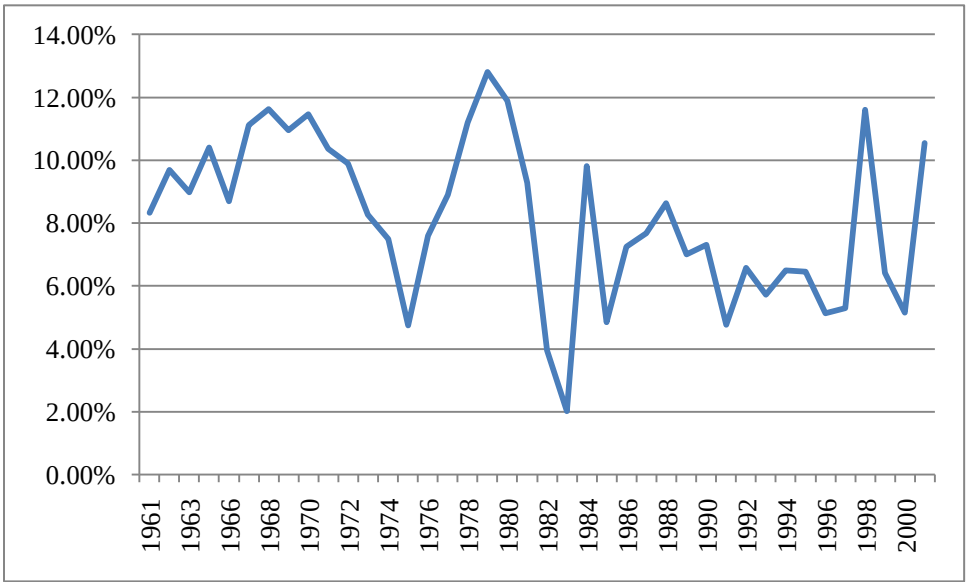

Figure 7. Per Capita Gross Domestic Product (PCGDP) Percent Change in Puerto Rico.

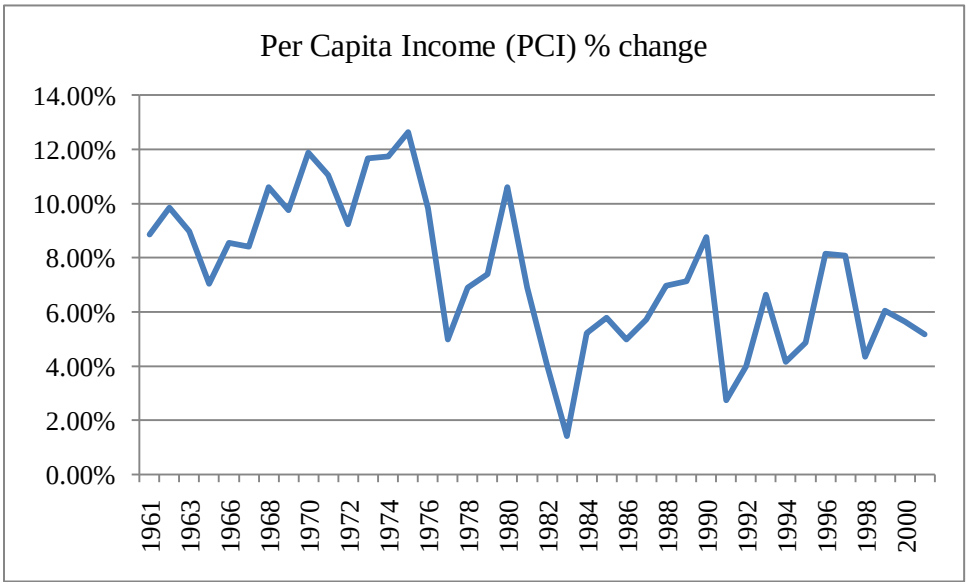

Figure 8. Per Capita Income (PCI) Percent Change in Puerto Rico

Since the data sets range in years of availability, the regressions and correlations were run using those years where the data overlaps. To continue with the Sample 2, the

analysis of how the Puerto Rican economy effects tithe giving was from the years 1961-2001. Table 3 shows the years to be used.

Table 3

Data for Regression Model

Year	PCT % change	PCI % change	PCGDP % change
1961	6.58%	8.86%	8.32%
1962	8.62%	9.86%	9.69%
1963	15.93%	8.97%	8.99%
1965	7.95%	7.05%	10.40%
1966	10.35%	8.55%	8.69%
1967	0.49%	8.40%	11.12%
1968	8.56%	10.60%	11.62%
1969	6.39%	9.76%	10.96%
1970	5.49%	11.88%	11.46%
1971	11.04%	11.05%	10.36%
1972	-6.25%	9.24%	9.89%
1973	24.09%	11.67%	8.27%
1974	7.85%	11.73%	7.49%
1975	1.36%	12.65%	4.73%
1976	7.01%	9.83%	7.60%
1977	2.28%	4.98%	8.90%
1978	7.60%	6.91%	11.19%
1979	2.40%	7.39%	12.80%
1980	13.07%	10.60%	11.89%
1981	4.05%	6.90%	9.28%
1982	-5.01%	4.04%	3.95%
1983	-4.29%	1.41%	2.01%
1984	4.99%	5.21%	9.82%
1985	5.00%	5.79%	4.85%
1986	7.26%	5.00%	7.25%
1987	9.90%	5.72%	7.67%
1988	3.12%	6.98%	8.62%
1989	7.10%	7.13%	7.00%
1990	5.35%	8.75%	7.31%
1991	5.11%	2.74%	4.76%
1992	10.37%	3.98%	6.57%
1993	5.20%	6.63%	5.72%
1994	7.45%	4.16%	6.50%
1995	3.28%	4.88%	6.46%

Table 3 (Continued).

Year	PCT % change	PCI % change	PCGDP % change
1996	3.23%	8.15%	5.13%
1997	2.33%	8.08%	5.29%
1998	-0.38%	4.35%	11.60%
1999	5.74%	6.05%	6.41%
2000	0.06%	5.64%	5.14%
2001	11.11%	5.17%	10.55%

Conclusion

Religion is a fundamental component of every culture. Anthropologists know of no people anywhere on the planet who, at any time, have been without some form of spirituality or religion (Haviland et al. 2008) with sociologists arguing that it meets basic human needs (Henslin 2002). This may help explain why economists have started to recognize that religion's role should be acknowledged to fully understand the workings of economic systems (Nelson 2001) and that it is an important determinant of economic development (Swager 2000). Barro and McCleary (2002) write that economic growth analysis must include social factors such as religion. The goal of this dissertation is to add to the understanding regarding the relationship between religion and economic development that has been a focus of research for decades and philosophy for centuries.

Opitz (1994) writes that a science of the means, like economics (Von Mises 1996), needs a connection with a science of the ends, like religion, because a means by itself is meaningless; it is defined in terms of the end to which it is connected. In both developed and emerging countries, the resilience of religion, with its universal influence on political will and popular debate, has been observed (Iannaccone 1998; Finke and Starke 2001; Glaeser 2005). This is almost certainly ideal, since appending economic attitudes and

activities with beliefs, norms and values gives a more realistic picture of human behavior (Mangeloja 2003).

While there is no consensus on the exact causal relationship between religion and economic development, most empirical studies point to a positive relationship (Khan and Bashar 2008). This can be because religions often promote honesty, hard work, education and other activities that often produce positive economic outcomes, meanwhile discouraging activities that often produce negative economic outcomes. Through the lenses of Mundell's (1961) Optimal Currency Area framework, the Human Development Index and Azzi and Ehrenberg (1975), this dissertation added to this discussion on the intersections of religion and economic development.

CHAPTER II

FROM THE FED TO *LA FORTALEZA* - THE EFFECTS OF UNITED STATES MONETARY POLICY SHOCKS ON PUERTO RICAN EMPLOYMENT

"[A]lmost all independent nations choose to assert their nationality by having, to their own inconvenience and that of their neighbours, a currency of their own."

John Stuart Mill, 1894

A recurring macroeconomic theme is the power of monetary policy to influence economic activity. This essay examines the impact of United States monetary policy on employment figures in Puerto Rico. In small, open and dollarized economies, like Puerto Rico's, it's necessary to consider outside influences. Given the high level of connection between the United States and Puerto Rican economies and the island's lack of an autonomous economic policy, this proves to be particularly pressing.

Because of this close integration between the United States and Puerto Rico, fluctuations in U.S. economic variables are easily transferred to the Puerto Rican economy and help determine both long- and short-term performance of the Puerto Rican economy (Alameda 2000, 2006). Yet, there is relatively limited research assessing the effects of U.S. monetary policy on the Puerto Rican economy (Kicinski 2007). This essay will add to the conversation assessing the asymmetric effects of U.S. monetary policy on Puerto Rico.

An overview of the Optimal Currency Area (OCA) literature will begin this essay, followed by an introduction to Puerto Rican history and economics. The theoretical framework used will then be introduced and immediately followed by data analysis.

Some possible implications and suggestions for additional research will conclude this paper.

Literature Review

Optimal Currency Area

Stemming from exchange rate regime debates after World War II, Mundell (1961) pioneered the theory of the Optimal Currency Area during a time when most countries fixed their currency to the U.S. Dollar, which was then convertible at a fixed rate into gold (Van 2004). Mundell implicitly defined an OCA as a currency area where the benefits of adopting a single currency outweigh the costs of relinquishing the exchange rate as an internal adjustment instrument (International Monetary Fund 1997). His optimum currency area idea asked the following question – when is it beneficial to relinquish monetary sovereignty in favor of a common currency? This compared a nation's benefits and costs from participation in a currency union. The benefits are lower transaction costs, price stabilization, improved resource allocation efficiency, and increased access to markets. However, a country's loss of sovereignty as to national monetary and exchange rate policies can be a significant cost.

McKinnon (1963) and Kenen (1969) also made some prominent contributions to OCA theory (Janicki, Warin and Wunnava 2005; Beckworth 2010). Highly open economies qualify for OCA status, argued McKinnon, as a common currency is important for stability and prosperity. Later, Kenen (1969) argued that highly diversified economies are good candidates for OCA status, since diversification reduces the risk of substantive demand shocks along with easing any adjustments to negative external shocks.

According to OCA theory, the use of a single currency eliminates losses due to currency transactions and the collection and processing of information necessary. These resources now become available for other uses. Optimal currency area theory also argues that there are efficiency gains from eliminating relative price distortions generated by the transaction costs and the elimination of exchange rate uncertainties (International Monetary Fund 1997).

Mundell's (1961) main conclusion was that the ideal area is not a nation, but rather a region characterized by price and wage flexibility, factor mobility, trade integration and similar external shocks. In recent years, Mundell's theory has been applied to both sides of the debate regarding the euro and the European Union (Krugman 1990) and consideration of Mundell's criteria is often considered de rigueur when deciding a country's currency policies (Frenkel 1985; Laraine and Velasco 2001). Mundell improved the theoretical basis of the modern fluctuating currency system, which has allowed policy makers to implement macro-stabilization policies and interventionism (Van 2004).

Research to make Mundell's theory operational developed a list of criteria that countries should fulfill in order to qualify as candidates for a potentially successful currency union. The list of optimal currency area criteria may be summarized by the following OCA "Decalogue" (Tavlas 1991, 1992; Bayoumi 1994; Bayoumi and Eichengreen 1997; De Grauwe 2001):

1. Factor mobility, and in particular labor mobility, across the members of the potential union.
2. High level of trade in goods across the members of the union.
3. Different (or diversified) composition of output and trade across countries.

4. Price and wage flexibility across members of the union.
5. Similar inflation rates across countries.
6. Financial markets should be integrated across countries.
7. Absence of "fiscal dominance" in the individual countries.
8. Low, and similar, levels of public sector debt in the different countries.
9. Similarity (or synchronization) of external shocks to which the different countries are exposed.
10. Political coordination across countries.

According to Mongelli (2002) OCA theory has had four phases. From the early 1960s to the early 1970s, came the "pioneering phase" that put forward the OCA properties, started the debate on currency area borders, and initiated cost/benefit analysis resultant from monetary integration. The OCA properties that emerged from this debate include price and wage flexibility, mobility of factors of production including labor, financial market integration, the degree of economic openness, the diversification in production and consumption, similarities of inflation rates, fiscal integration and political integration

The 1970s brought the "reconciliation phase" where optimal currency area properties started to be evaluated alongside one another to gauge their relative importance, while bringing together OCA properties and discussing national government policy options. Much of this literature focused on the four interrelationships between OCA members - the extent of trade, the similarity of shocks and cycles, the degree of labor mobility and the system of risk sharing (Frankel and Rose 1998).

Out of the "reassessment phase" of the 1980s and early 1990s emerged a new theory of optimum currency area. A progression of theoretical and empirical work led to a

reassessment of OCA theory along with monetary unification's benefits and costs. Opinions shifted mostly in favor of currency unions with an increased emphasis on the benefits of currency areas, which outweighed the loss of domestic macroeconomic policy autonomy. This empirically focused work resulted largely from an attempt to assess the appropriateness of European monetary unification, with another wave motivated by European Union (EU) eastern enlargement (Krčílkova and Zápal 2009).

The current "empirical phase" spans over the last two decades as optimal currency area properties are examined to investigate how their interpretation has evolved. The pioneering institutions of OCA theory have held up well to empirical investigation, as OCA properties are still discussed. These empirical studies have aimed to operationalize OCA theory by analyzing and comparing its properties and applying econometric techniques.

Puerto Rico

There are several academic attractions in choosing Puerto Rico as the geographical area under study. As an island it possesses an isolation that provides a natural research laboratory and Puerto Rico's distinctive relationship with the United States offers unique dynamics that have highlighted both the positive and negative results of closer integration with the United States (Grusky 1996).

Davis and Rivera-Batiz (2006) outline some specific favorable and unfavorable features of Puerto Rico's close integration with the United States. Favorable features include a stable financial environment, open movement of labor, capital and goods to and from the mainland, minimal price controls and no burdensome currency regulations or capital controls. Unfavorable measures include Unites States tax subsidies that have

distorted Puerto Rico's industrial structure, U.S. trade law loopholes that can effectively raise trade barriers, high government transfer payments that can undermine work incentives and an inefficient system for business licenses and building permits.

Despite being U.S. territory, rather than a sovereign country, Puerto Rican development policy has not been dictated by the colonial authority (Haggard 1990). Yet, the commonwealth, as the oldest colony in the world, has significant limitations to its sovereignty, whose laws have to be consistent with U.S. federal statutes (Suarez 2001). The Puerto Rican economy has features that differentiate it from the fifty states such as location, commonwealth status, large public sector and a lower socio-economic status (Bram, Martinez and Steindel 2008).

As part of the U.S. monetary and customs system, Puerto Rico does not have an independent exchange rate policy or trade policy (Maldonado-Bear and Walter 2006), and it operates under U.S. judicial and tariff systems (Collins, Bosworth and Soto-Class 2006). Section 936 of the Tax Reform Act of 1976, which added a tax credit on income earned in Puerto Rico and repatriated by U.S. firms, has had a major impact on Puerto Rican economic activities (Bosworth and Collins 2006). With the introduction of certain sophisticated manufacturing industries (Bram et al. 2008), these institutional links have had a positive and significant effect on growth (Padin 2003).

With one of the most dynamic and open economies in the Caribbean region (Collins, Bosworth and Soto-Class 2006; Vega-Rosado 2006), Puerto Rican economic development invites investigation from United States economists (Baumol and Wolff 1996) and is a case of legitimate interest to development scholarship (Padin 2003). While concluding that the Puerto Rican development model placed the island among the

world's top performers during 1950–90, Baumol and Wolff (1996) placed Puerto Rico in an international context and argued that the Puerto Rican experience held valuable lessons for emerging economies. Sotomayor (2004) writes that Puerto Rico represents one of the earliest examples of development through integration to the world economy, thus should be of special interest.

Located at the eastern end of the Caribbean Sea, the island of Puerto Rico was discovered on November 19, 1493, during Christopher Columbus' second voyage. Ponce de León began the Spanish colonization of the island in 1508 and thus it remained as a heavily fortified strategic location at the eastern end of the Spanish colonial empire until 1898 (Maldonado-Denis 1972; Wagenheim 1975; Carr 1984; Morales-Carrion 1984; Fitzpatrick 1987; Pico 2006).

Formally ceded by the Treaty of Paris after the Spanish-American war, Puerto Rico became an American possession on December 10, 1898. The 1917 Jones Act granted United States citizenship to Puerto Ricans and provided for the popular election to both houses of the legislature. However, appointing the governor remained the provenance of the President of the United States. The U.S. Congress amended the act in 1947, granting Puerto Ricans the right to elect their own governor. Luis Muñoz Marín became Puerto Rico's first democratically elected governor, taking office in January 1949. Fashioned under the leadership of Muñoz Marín, Puerto Rico's political status is called the Free Associated State of Puerto Rico. This provided for the increased autonomy of the island and established a relationship between Puerto Rico and the United States similar to commonwealth status (Maldonado-Denis 1972; Wagenheim 1975; Carr 1984; Morales-Carrion 1984; Fitzpatrick 1987; Pico 2006).

Puerto Rico's economy was primarily agricultural with early products like ginger, coffee, sugar and molasses, but under U.S. rule sugar began to dominate and nearly developed into a monoculture. Today, agriculture is less than 1% of output, down from 6% in 1977 and 17% in 1954 (Bosworth and Collins 2006; Bram et al. 2008). A major reason for this agricultural abandonment is that despite a large diaspora to the mainland United States, there is a relatively high population density (Gould et al. 2008).

Economic interests between Puerto Rico and the United States brought Puerto Rican merchants to the eastern United States even while Puerto Rico was still under Spanish rule. After 1898, it was the Jones Act that enabled mobility free from immigration barriers, as all Puerto Ricans were now U.S. citizens. Puerto Rican economic woes led to the promotion of colonization plans and contract labor programs in places like Hawai'i with U.S. employers recruiting Puerto Ricans as a source of low-wage labor. By relying on social networks of family and friends Puerto Ricans helped each other migrate, settle, find work and build communities. By the 2000 census 3,623,392 Puerto Ricans resided in Puerto Rico with 3,406,178 in the United States (Whalen 2005).

Despite the Jones Act, the diaspora and the economic and political ties to the United States, nearly half of Puerto Rico's residents live below the U.S. poverty line (Bram, et al. 2008). With the income gap relative to the mainland widening, Puerto Rico remains significantly less prosperous than even the poorest U.S. state (Collins, Bosworth and Soto-Class 2006; Bram et al. 2008). Nevertheless, it has a per capita income substantially higher than the rest of Latin America and Puerto Rican quality-of-life measures such as literacy rates, years of schooling and life expectancy are closer to the most highly developed countries. While dropout rates are very high in low-income family students

(Ladd and Rivera-Batiz 2006), Puerto Rico education levels exceed the most educated Latin American nations (Collins, Bosworth and Soto-Class 2006).

United States federal government transfer payments are a large portion of Puerto Rican residents' income, providing approximately ¼ of Puerto Rican personal income (Burtless and Sotomayor 2006). While it is believed that many jobless Puerto Ricans work in the informal economy, the Puerto Rican economy suffers from a significant employment shortfall, where the male participation was around 58% during the early 2000s. In 2000 the island had the lowest employment-to-population ratio in the Americas and Caribbean, with only 31% of the population employed. U.S. Federal and local government is the island's largest employer and there is a private sector jobs shortfall, with only 28% of Puerto Rican adults working in the private sector (Enchautegui and Freeman 2006; Davis and Rivera-Batiz 2006; Burtless and Sotomayor 2006).

Puerto Rico introduced the economic development program Operation Bootstrap in 1948 under the leadership of Muñoz Marín. This development plan was based on attracting foreign direct investment through tax incentives and infrastructure investments, rather that the then traditional approach of an internal development process (Sotomayor 2004). Over the past several decades the economy has grown at a greatly reduced rate and since 1980 living standards have not converged with those of the U.S. (Bosworth and Collins 2006). This led to later analysis of Puerto Rico's development plans to receive less enthusiastic reviews (Dietz 1986).

Rodriquez and Toledo (2007) outlined some of the principal characteristics of the Puerto Rican economy. Included in this list is the argument that American monetary policy determines Puerto Rican economic conditions, an argument that contributed to the

genesis of this chapter. Since 1898 Puerto Rico has been dollarized, consequently Puerto Rico's money supply depends on U.S. monetary policy and Puerto Rico cannot use monetary policy to stabilize its economy. Puerto Rico's banking system is integrated into the United States', with the U.S. unilaterally dictating regulations. Like any U.S. state's economy, yet unlike the majority of dollarized economies, American policy can impact the Puerto Rican economy through interest rates, market regulations and capital reserve requirements (Dietz 1986)

Methodology

Literature Review - Vector Autoregression

Since the early 1980s the most common method used in the economic literature to estimate the effects of monetary policy has been the vector autoregression or VAR (Stock and Watson 2001). Sims (1980) first advocated for VAR models as a theory-free technique to estimate economic relationships and provided a macroeconomic framework where each variable is expressed by its own lagged values, along with past values of the other variables. Subsequently, Lutkepohl (1991, 1999), Watson (1994) and Waggoner and Zha (1999) expanded the literature.[10] Generally employing a small number of variables expressed as past values of the variables in the model, a VAR is a time series model for gathering evidence of business-cycle dynamics (Carlino and DeFina 1999b). The VAR, therefore, is ideally suited to the task of estimating sudden changes or shocks to monetary policy. Most studies that use VARs to examine monetary policy focus on the effect that the Federal Reserve has on the national U.S. economy. However, over the last few decades there has emerged a literature that uses VARs to examine the regional

[10] Additional VAR literature includes: Todd (1990), Runkle (1987), Sims (1986), Cooley and LeRoy (1985) and Hakkio and Morris (1985).

effects of monetary policy. The seminal work in this literature was Carlino and DeFina (1998), which examined the effect on monetary policy shocks on the eight Bureau of Economic Analysis (BEA) regions in the United States. Using real personal income for each of the BEA regions as a proxy for economic activity and the federal funds rate as a measure of monetary policy, they estimated a VAR to determine if regions respond differently to monetary policy shocks for the period 1958:Q1 to 1992:Q4. They found significant variation in how the regions responded to the negative monetary policy shocks (i.e., an unexpected increase in the federal funds rate). In particular, the Great Lakes region was found to be the most adversely affected by such monetary policy shocks while the Southwest and Rocky Mountain regions were the least affected of any BEA area. Employing the same VAR and economic variables, Carlino and Defina (1999 a, b) later extended their work to the state level and found similar regional variation among the states in their response to negative monetary policy shocks. In their attempt to explain the regional variation they found that industrially diverse states were less affected by monetary policy changes than states with higher interest-sensitive industries like manufacturing and construction.

More recently, while measuring cyclical fluctuations and asking if there is an international business cycle, Kouparitsas (2001) estimates a VAR that includes the real personal income of the eight Bureau Economic Analysis regions, oil prices, and the federal funds rate. He found that the New England, Mideast, Great Lakes, Rocky Mountains and Far West regions are core regions that have similar sources of economic disturbance and responses. The Southeast, Plains and Southwest are non-core regions that differ in their sources of disturbance or response to disturbances. Fratantoni and

Schuh (2003), showing how coastal housing booms may influence the effectiveness of monetary policy, estimate region-, state-, and metropolitan statistical area-level effects of monetary policy shocks using vector autoregressions. Their model evidences significant variation in the magnitude and duration of responses to monetary policy shocks, while arguing that monetary policy effects on the economy are "long and variable" (582).

Employing a VAR model, Owyang and Wall (2006) use monthly state level data to show how each state economy responds to a specific monetary policy shock as compared to the national economy. The found that regional effects of monetary policy were considerably dampened during the Volcker-Greenspan era and that regional differences are related to the concentration of the banking sector and industry mix. While asking whether the "United States is best served by a single currency," Beckworth (2010, 1) researched the effects of U.S. monetary policy shocks on state economies using monthly state-level data. His VAR model found that that some regions of the United States may have benefited from having their own currency.

Studies exploring the relationship between U.S. monetary policy and the Puerto Rican economy include Toledo (1996), demonstrating that the U.S. money supply is a significant variable in the Puerto Rican economy, Alameda (1998) finding that the Puerto Rican economy is more sensitive to U.S. monetary policy shocks the United States itself and Colon and Martinez (1999) studying the role that U.S. monetary policy has on the Puerto Rican banking system. More recent and relevant works includes Rodríguez's (2002) use of a VAR model to estimate the relationship between the United States money supply and Puerto Rican price level, real income and prime rate. Later, Rodríguez (2004) again used a VAR model to estimate the relationship between the United States money

supply and Puerto Rican price level, real production and prime rate. His models aimed to catch the empirical regularities in the evolution of prices and estimate for the long-run price equation. He found that the price level in Puerto Rico is influenced both by U.S. monetary policy and the island's economic activity and long-run price level changes can be calculated then used to estimate the future inflation of Puerto Rico. As a result of his findings, Rodríguez argues that movements to the U.S. rate and its impact can be followed closely enough that Puerto Rico can take measures to ensure sustainable growth despite any innovations to the federal funds rate. These findings were similarly echoed by Toledo (2002), who also used a VAR model employing United States monetary policy and Puerto Rican price levels.

Rodríguez and Toledo (2007) use a VAR model to examine the impact of United States monetary policy on the Puerto Rican economy using U.S. interest rates, Puerto Rican employment and inflation figures. Their model suggests that U.S. monetary actions precede movements of the two Puerto Rican economic indicators and Unites States monetary policy directly impacts prices in the short run and real growth in the long run. To study the effects of United States monetary policy on the economy of Puerto Rico, Rodríguez (2007) uses a near-var model with the inflationary rate growth and the Gross National Product (GNP) acceleration rate as indicators of Puerto Rican economic activity, and the federal funds rate as a monetary policy measurement. His model showed that U.S. monetary policy, whether anticipated or not, significantly impacts the GNP acceleration rate in the short and long run.

As compared to the above-cited works studying the effects of U.S. monetary policy and Puerto Rico, one of the innovations of this research is the use of actual jobs lost or

gained, rather than employment rates and percentages. Another difference is the inclusion of various U.S. economic variables in the VAR model. However, the main distinction is that while these studies on Puerto Rico investigate the effect of monetary policy shocks in general, this chapter asks a narrower question: Does the impact of U.S. monetary policy shocks shed any insight as to whether Puerto Rico belongs in the dollar union?

Methods

- Research Question: How do United States monetary shocks affect Puerto Rican employment?
- Hypothesis: Negative United States Monetary Shocks affect the Puerto Rican economy by causing Puerto Rican employment figures to fall.

To answer these questions this chapter made use of a vector autoregression that tracks how unexpected changes to monetary policy—as measured by the federal funds rate—impacts the Puerto Rican economy. There are two types of Vector Autoregression: reduced form and structural. The reduced form model is what gets estimated and is turned into a structural model by imposing theoretical restrictions. These restrictions help identify "structural shocks," in this case the monetary policy shock. In this study, two sets of identifying restrictions will apply. First, recursive restrictions are applied such that the federal funds rate can respond to, but not affect, the other macroeconomic variables contemporaneously. This restriction is consistent with standard macroeconomic theory, which says that monetary policy can only affect the real economy with a lag. Second, restrictions are imposed such that the Puerto Rican economy can be affected by the U.S. economy but not vice versa. This latter restriction is based on the notion that is

Puerto Rico is "too small to matter" in regards to influencing the general U.S. economy. This approach provided realistic restrictions on the relationship between the U.S. and the Puerto Rican economy.

To think about this more formally, the structural VAR can be stated s follows:

$$A_0 y_t = A_1 y_{t-1} + ... + A_p y_{t-p} + u_t \qquad (1)$$

where $A_0,...,A_p$ are *n x n* structural parameters matrices, y_t is a *n x 1* vector of endogenous variables, and u_t is a *n x 1* vector of uncorrelated structural shocks that are assumed to be multivariate normal with mean zero and unit variance.[11] The structural vector autoregressive model can be transformed into a structural vector moving average form so that the relationship between the endogenous variables and the structural shocks can be defined. This structural moving average model can be shown to be

$$y_t = (D_0 + D_1 L + D_2 L^2 + ...)u_t$$

$$= D(L)u_t, \qquad (2)$$

where $D_0 = A_0^{-1}, D_i = (A_0^{-1}A_i)^i A_0^{-1}$, L denotes the lag operator, and i =1,..,p. The coefficient matrices in $D(L)$ represent the dynamic multipliers of the structural shocks. As it stands, (2) is still a structural model and cannot be estimated directly. Rather, a reduced form version must be estimated and then identifying restrictions imposed to recover the structural model. The reduced form moving average can be expressed as follows:

$$y_t = (I + C_1 L + C_2 L^2 + ...)\varepsilon_t$$

$$\underline{y_t = C(L)\varepsilon_t}. \qquad (3)$$

There is a mapping between the reduced-form parameters in (3) and the structural

[11] For the sake of exposition, the constant terms are dropped in equation (1).

parameters in (2) since $\varepsilon_t = D_0 u_t$, $C(L) = D(L)D_0^{-1}$ and $E\varepsilon_t\varepsilon_t' = \Sigma = D_0 D_0'$. However, this mapping is not unique as an infinite number of values of D_0 can satisfy $\Sigma = D_0 D_0'$. Consequently, even though the reduced form parameters $C(L)$ and Σ are directly estimable, identifying restrictions need to be imposed to recover the structural shocks.

As mentioned above, the identification strategy adopted here is to identify the model using the standard recursive approach outlined by Christiano, Eichenbaum and Evans (1999). This way the federal funds rate—the instrument of monetary policy—is able to respond instantaneously to shocks in the other macroeconomic variables, but can only affect them with a lag. This approach takes the Choleski decomposition of Σ which restricts D_0 to be lower triangular and thus orthogonalizes the shocks into a causal ordering that follows the variable ordering in the y_t vector. In addition, the constraint that the regional economic variable (i.e., Puerto Rico's employment) cannot affect the macroeconomic variables requires setting to zero those elements of the structural A matrices where the regional economic variable is linked to the national economic variables. Given these coefficient restrictions and the contemporaneous impact restrictions made by the recursive identification strategy, the regional economy variable cannot influence the macroeconomic variables in any manner. The coefficient restrictions also mean the macroeconomic equations have different right-hand-side variables than the state economy equations. Technically, this model is working with a restricted VAR and, as a result, there are efficiency gains in using the Seemingly Unrelated Regression (SUR), which employs generalized least squares, to estimate the model. Other using comparable VAR models include Barth and Ramey (2001), Davis

and Haltiwanger (2001), Frantantoni and Schuh (2003), Lastrapes (2005, 2006), Irvine and Schuh (2005) and Beckworth (2010).

The endogenous variables estimated in this VAR are as follows:

$$z = (y_{usa}, emp_{usa}, cpi, ppi, ffr, emp_{pr})',$$

where y_{usa} is the Industrial Production Index for the United States, emp_{usa} is United States Total Non-farm Employment, cpi is the Consumer Price Index for the United States, ppi is the Producer Price Index for the United States, ffr is the Federal Funds Rate for the United States and emp_{pr} is Puerto Rico Total Non-farm Employment. To determine how important monetary policy shocks are for the other variables, impulse response functions (IRFs) will be used, which trace responses to exogenous shocks, will show the response to a one standard deviation monetary policy shock. Monetary policy is considered to be generating asymmetric effects to the extent that there are statistically significant differences among these IRFs (Beckworth 2010).

The shocks, or the error term, are the closest thing to an independent variable in this model and are the "surprise" movements in the variables after accounting for their past values. Since it represents how much the actual interest rates deviate from the model's forecast, the forecast error can be thought of as the monetary "shock," and these shock/residuals are considered to be exogenous.

In this research, the VAR model involves six equations, which determine the endogenous variables:

On the macro level -

1. United States Industrial Production Index as a function of past values of U.S. Industrial Production Index (y_{usa}), past values of U.S. Total Non-farm

Employment (emp_{usa}), past values of the U.S. Producer Price Index (ppi), past values of the U.S. Consumer Price Index (cpi) and past values of the U.S. Federal Funds Rate (ffr).

2. United States Total Non-farm Employment as a function of past values of U.S. Industrial Production Index (y_{usa}), past values of U.S. Total Non-farm Employment (emp_{usa}), past values of the U.S. Producer Price Index (ppi), past values of the U.S. Consumer Price Index (cpi) and past values of the U.S. Federal Funds Rate (ffr).
3. United States Producer Price Index as a function of past values of U.S. Industrial Production Index (y_{usa}), past values of U.S. Total Non-farm Employment (emp_{usa}), past values of the U.S. Producer Price Index (ppi), past values of the U.S. Consumer Price Index (cpi) and past values of the U.S. Federal Funds Rate (ffr).
4. United States Consumer Price Index as a function of past values of U.S. Industrial Production Index (y_{usa}), past values of U.S. Total Non-farm Employment (emp_{usa}), past values of the U.S. Producer Price Index (ppi), past values of the U.S. Consumer Price Index (cpi) and past values of the U.S. Federal Funds Rate (ffr).
5. United States Federal Funds Rate as a function of past values of U.S. Industrial Production Index (y_{usa}), past values of U.S. Total Non-farm Employment (emp_{usa}), past values of the U.S. Producer Price Index (ppi), past values of the U.S. Consumer Price Index (cpi) and past values of the U.S. Federal Funds Rate (ffr).

On the regional level -

6. Puerto Rico Total Non-farm Employment as a function of past values of U.S. Industrial Production Index (y_{usa}), past values of U.S. Total Non-farm Employment (emp_{usa}), past values of the U.S. Producer Price Index (ppi), past values of the U.S. Consumer Price Index (cpi), past values of the U.S. Federal Funds Rate (ffr) and past values of P.R. Total Non-farm Payroll (emp_{pr}).

All variables are in a monthly frequency. The Consumer Price Index, the Producer Price Index, the Federal Funds Rate and the Industrial Production Index come from the St. Louis Federal Reserve Bank's FRED database and the data was acquired in July 2010. The chosen time period includes the recognized early-1980s structural break in monetary policy (Boivin and Giannoni 2006).

The econometric analysis software package gretl (Gnu Regression, Econometrics and Time-series Library) 1.9.1 was utilized to seasonally adjust the employment data and the Producer Price Index. Gretl used X-12-ARIMA[12] (autoregressive integrated moving average), the method used by the U.S. Bureau of Labor Statistics (Bureau of Labor Statistics 2010). The Industrial Production Index data and the Consumer Price Index data came seasonally adjusted from the FRED database. The econometrics and time-series analysis software package RATS (Regression Analysis of Time Series) 7.1 was utilized to run the VAR model. When using VAR modeling the necessary number of lags is not readily apparent (McCarty and Schmidt 1997). There needs to be a sufficient number to ensure that the innovations are not autocorrelated, while avoiding excessive lags that diminish the model's precision. Therefore, to determine how many lags are needed to

[12] X-12-ARIMA was developed by the United States Census Bureau and is a standard method for seasonally adjusting data.

eliminate serial correlation, the Ljung-Box Q Test[13] was used. Seven lags were used to estimate the VARs are estimated since the Ljung-Box Q test indicated that this many lags are sufficient to whiten the residuals of any serial correlation. Monte Carlo integration techniques[14] were used to estimate the standard error bands.

To afford additional perspective to the results from Puerto Rico, the same VAR model was applied to employment numbers from the U.S. Virgin Islands and Hawai'i. These locations where chosen for their similarities to Puerto Rico. All three are islands a fair distance from the U.S. mainland, dollarized economies, thus subject to the dictates of U.S. monetary policy and closely allied to the U.S. politically and economically.

With an approximate population of 109,775, the U.S. Virgin Islands are located between the Caribbean Sea and the Atlantic Ocean, 90 miles east of Puerto Rico and immediately west of the British Virgin Islands. This archipelago was divided into two territorial units during the 17th century, one British and one Danish. The United States purchased the Danish portion in 1917 and today it is an organized, unincorporated territory of the United States (Danish National Archive 2002).

Though there are several dozen islands, four main islands compose the territory: Saint Thomas, Saint John, Saint Croix, and Water Island. Providing 80% of the GDP and employment, tourism is easily the Virgin Island's primary economic driver. Additional industries include petroleum refining (Saint Croix houses one of the world's largest petroleum refineries), rum distilling, textiles, electronics, pharmaceuticals, and watch assembly (Danish National Archive 2002).

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[13] See Ljung and Box (1978).
[14] See Sims and Zha (1999).

Strategically important to United States global defense system and serving as a transportation hub of the Pacific basin, Hawai'i became the 50th U.S. state on August 21, 1959. Located in the central Pacific Ocean, Hawai'i is a group of volcanic islands approximately 2,400 miles west of San Francisco, California. Landing on Kauai on January 20, 1778, British explorer Captain James Cook is generally credited as the first European to discover Hawai'i (History Channel 2010).

With an estimated population of 1.3 million people, Hawai'i has eight major islands and 124 islets. Though tourism is its largest industry, agriculture remains a major part of the local economy and the Mauna Kea Observatory has contributed to Hawai'i becoming a major center of astronomy. Yet, among U.S. states Hawai'i ranks low in terms of personal income (History Channel 2010).

Analysis

As the Puerto Rican business cycle generally follows that of the United States (Bram, Martinez and Steindel 2008) it is not unexpected that U.S. monetary policy shocks generate asymmetric effects in Puerto Rico. [15] However, that the Puerto Rican employment response to such shocks appears worse than the United States, the U.S. Virgin Islands and Hawai'i makes for an interesting discovery.[16]

Just six months after the shock, the average drop in employment numbers was over 300% worse for Puerto Rico than for the United States as whole. Hawai'i, which actually

[15] Toledo (1996) demonstrated that the U.S. money supply is a significant variable in the Puerto Rican economy.

[16] This echoes Alameda's (1998) finding that the Puerto Rican economy is more sensitive to U.S. monetary policy shocks the United States itself.

saw an average *increase* six months after the shock,[17] saw results 15 times better[18] than Puerto Rico. Puerto Rico's drop as compared to the Virgin Island's was about 37% worse. In brief, the results are as follows:

- One years after the shocks Puerto Rican employment declined 0.24%, while the U.S. employment declined 0.09%, with Hawai'i down 0.09% and the Virgin Islands off 0.22%.
- Two years[19] after the shocks Puerto Rican employment declined 0.32%, while the U.S. employment declined 0.13%, with Hawai'i down 0.17% and the Virgin Islands off 0.21%.
- Three years after the shocks Puerto Rican employment declined 0.25%, while the U.S. employment declined 0.09%, with Hawai'i down 0.19% and the Virgin Islands off 0.15%.

Puerto Rico's worse month was a 0.33% decline as compared to 0.13% for the United States, 0.19% for Hawai'i and 0.24% for the Virgin Islands. Table 4 highlights the difference between the Puerto Rican response to the shocks and those of the other territories in the VAR model.

Table 4

Puerto Rico as Compared to Other Territories

Puerto Rico as compared to:			
Months After Shock	Hawai'i	Virgin Islands	United States
6	1258%	37%	302%
12	173%	10%	171%

[17] This anomaly did not last for long. By the seventh month, Hawai'i was starting to see drops in employment like the other regions investigated. Three years later, Hawai'i results were actually the closest to Puerto Rico's.
[18] Or, less worse?
[19] The trough for Puerto Rico was in month 22.

Table 4 (Continued).

Months After Shock	Hawai'i	Virgin Islands	United States
18	120%	30%	153%
24	88%	49%	145%
30	58%	61%	153%
36	33%	60%	179%

To help summarize the findings, Table 5 reports 36-month impulse response function (IRF) for each territory. Since the IRFs are cumulative they can be interpreted as the percent change in the level of employment. According to the results outlined by the VAR model, most of the economic decline from a positive one-unit federal funds rate shock occurs by 24 months. Nevertheless, three years after the fact, all regions in the model are still feeling the hangover from the shock.

Table 5

Average Response to Monetary Policy Shocks in Months after Shock

Months	Puerto Rico	Hawai'i	Virgin Islands	United States
1	-0.037358	0.026546	0.016519	0
2	-0.046527	0.014509	-0.002363	-0.00281
3	-0.028681	0.030042	0.051468	0.003115
4	-0.071835	-0.00058	-0.016972	-0.009322
5	-0.074525	0.034073	-0.048249	-0.017836
6	-0.147254	0.012714	-0.107157	-0.036651
7	-0.161262	-0.030627	-0.139053	-0.04735
8	-0.160106	-0.053778	-0.144722	-0.055993
9	-0.193076	-0.064359	-0.162436	-0.06697
10	-0.219295	-0.074172	-0.184408	-0.074145
11	-0.233733	-0.069991	-0.207674	-0.082249
12	-0.243637	-0.089333	-0.220678	-0.089842
13	-0.258462	-0.102903	-0.225099	-0.096921
14	-0.277367	-0.109685	-0.232124	-0.1043
15	-0.292264	-0.115866	-0.23897	-0.110162
16	-0.3007	-0.124288	-0.243373	-0.116776
17	-0.308014	-0.131339	-0.242621	-0.121371
18	-0.314999	-0.14343	-0.241618	-0.124697

Table 5 (Continued).

Months	Puerto Rico	Hawai'i	Virgin Islands	United States
19	-0.321034	-0.150121	-0.239722	-0.126823
20	-0.323627	-0.15481	-0.234043	-0.127755
21	-0.325311	-0.159171	-0.229077	-0.128696
22	-0.32632	-0.164101	-0.223603	-0.130915
23	-0.3254	-0.166228	-0.218893	-0.130989
24	-0.320867	-0.171129	-0.214805	-0.130853
25	-0.320467	-0.174966	-0.208885	-0.129307
26	-0.316436	-0.179022	-0.203263	-0.128245
27	-0.312453	-0.182819	-0.199234	-0.126039
28	-0.307055	-0.183851	-0.196201	-0.123534
29	-0.30221	-0.185085	-0.188391	-0.119962
30	-0.294197	-0.185706	-0.182793	-0.11644
31	-0.288268	-0.185352	-0.17675	-0.111357
32	-0.279698	-0.183977	-0.173669	-0.107456
33	-0.272419	-0.186192	-0.16649	-0.101659
34	-0.263491	-0.18703	-0.163059	-0.097369
35	-0.254227	-0.185447	-0.159307	-0.092987
36	-0.24601	-0.18519	-0.154044	-0.088156

Figure 9 reports the estimated cumulative IRFs for all coincident indicators from a positive one standard deviation shock to the federal funds rate. Since the IRFs are cumulative they can be interpreted as the percent change in the employment level. Though they trend similarly, this graph illustrates how the Puerto Rican employment response to U.S. monetary policy shocks is worse than the United States, the U.S. Virgin Islands and Hawai'i. However, Figure 10 reports the extent of the difference, as it shows only the upper error bands of the IRFs as compared to the United States. For both Hawai'i and the U.S. Virgin Islands the upper error band crosses the United States IRF, showing that the responses for those regions are not statistically significant as compared to the United States. However, the Puerto Rico upper error band does not cross the U.S. IRF, suggesting a statistically significant difference.

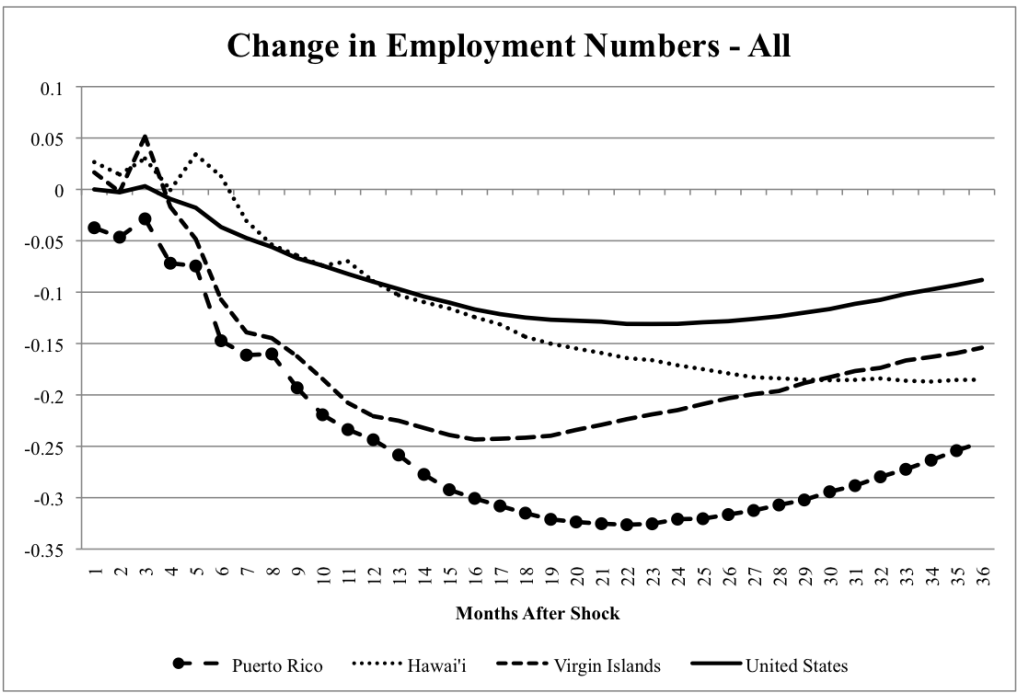

Figure 9. Impulse Response Functions to a Monetary Policy Shock – All Territories.

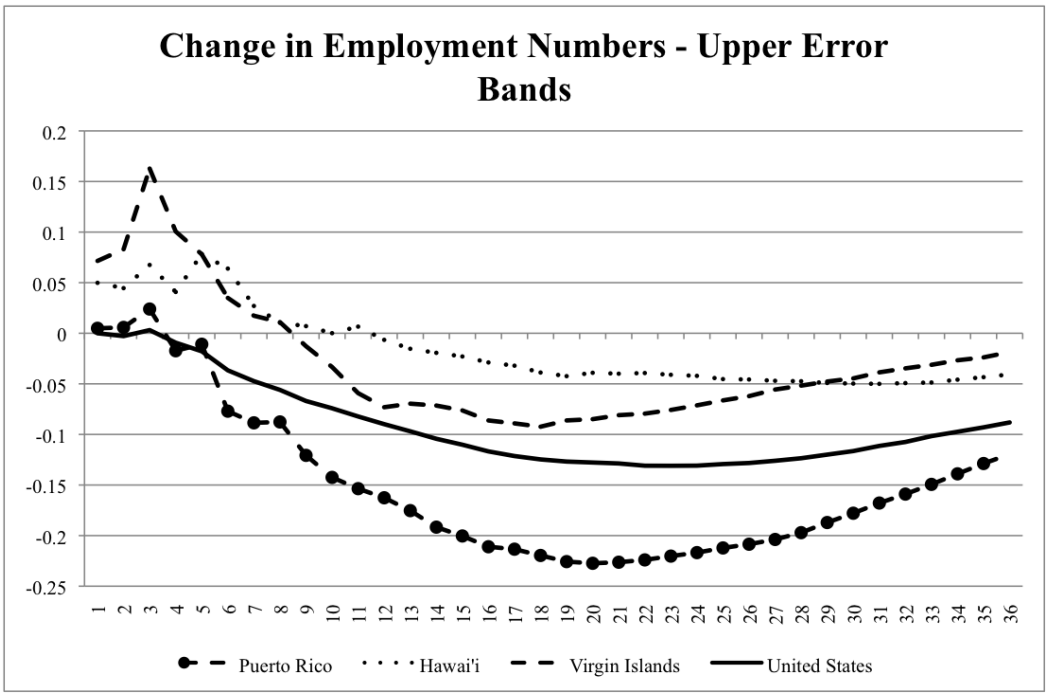

Figure 10. Impulse Response Functions to a Monetary Policy Shock: Upper Error Bands – All Territories.

Figures 11 and 12 report the estimated cumulative IRFs for each individual territory's coincident indicators are compared to the others from a positive one standard deviation

shock to the federal funds rate. Since the IRFs are cumulative they can be interpreted as the percent change in the employment level. These graphs illustrate the Puerto Rican employment response to U.S. monetary policy shocks as compared to the U.S. Virgin Islands and Hawai'i. These graphs suggest that the responses may not be statistically significant when comparing Puerto Rico, U.S. Virgin Islands and Hawai'i through the entire error band.

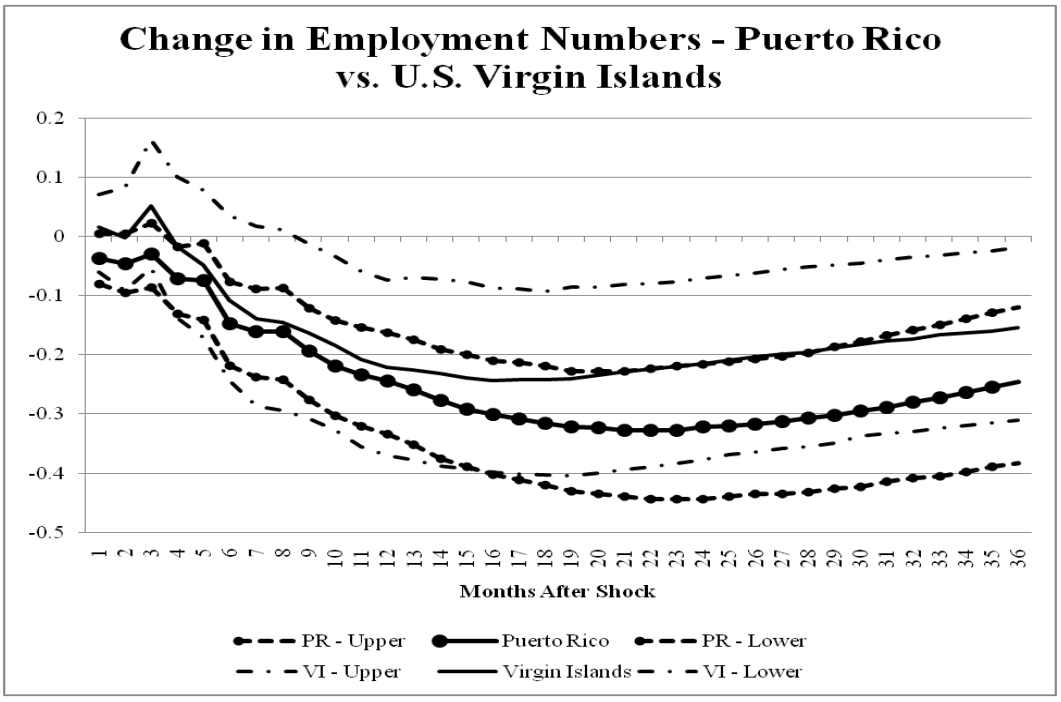

Figure 11. Impulse Response Functions to a Monetary Policy Shock – Puerto Rico and U.S. Virgin Islands.

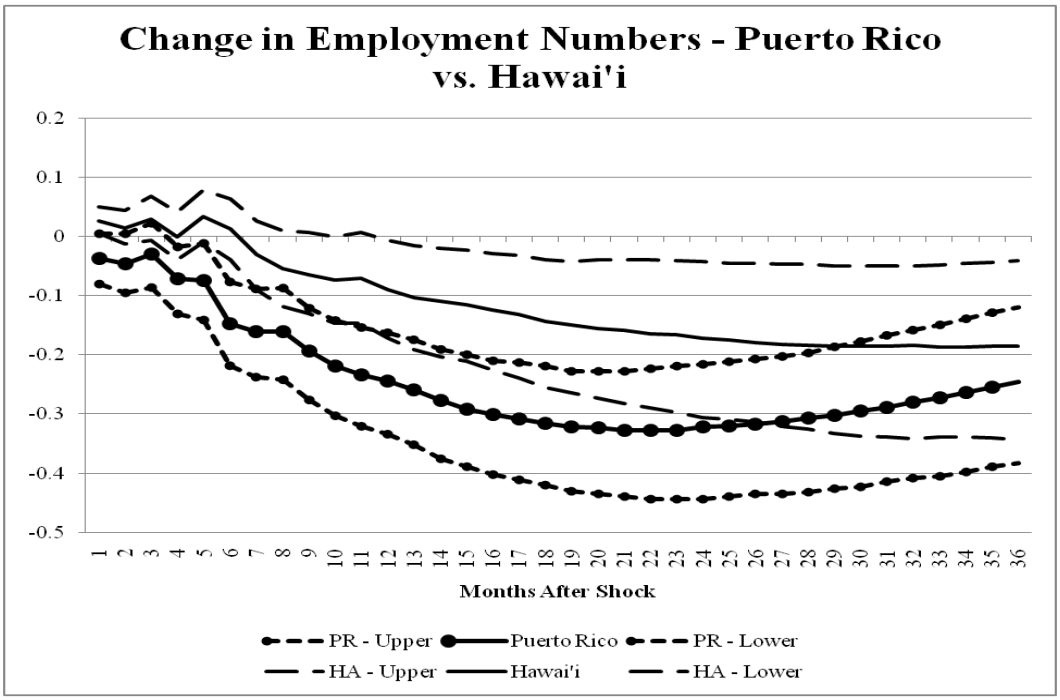

Figure 12. Impulse Response Functions to a Monetary Policy Shock – Puerto Rico Hawai'i.

Figures 13-15 report the estimated cumulative IRFs for each individual territory's coincident indicators are compared to the U.S. from a positive one standard deviation shock to the federal funds rate. Since the IRFs are cumulative they can be interpreted as the percent change in the employment level. For each territory, the dashed lines shows the IRF, the solid line shows the IRF for the United States. Other dashed lines show the simulated standard error bands to account for the precision of the estimates. Unlike Hawai'i and the Virgin Islands, the standard error bands for Puerto Rico do not cross over the U.S.'s. These results illustrate how the Puerto Rican employment response to U.S. monetary policy shocks is significantly worse than the United States, the U.S. Virgin Islands and Hawai'i. Figure 13 illustrates how Puerto Rico's errors bands do not cross with the United States as the only area under study that showed a significant difference.

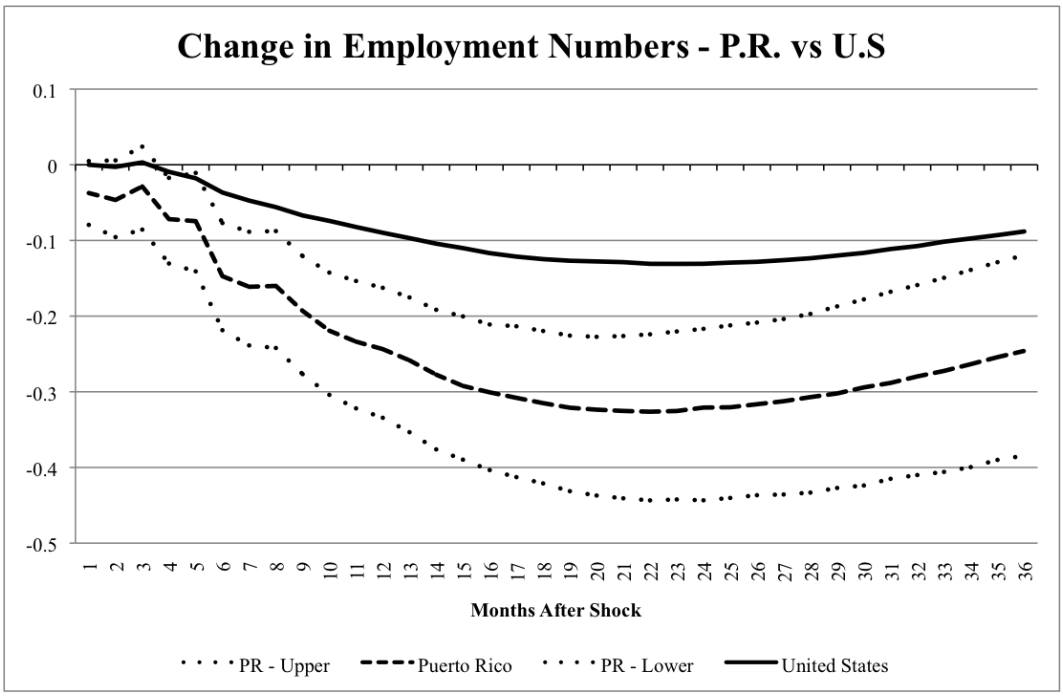

Figure 13. Impulse Response Functions to a Monetary Policy Shock – Puerto Rico and the United States.

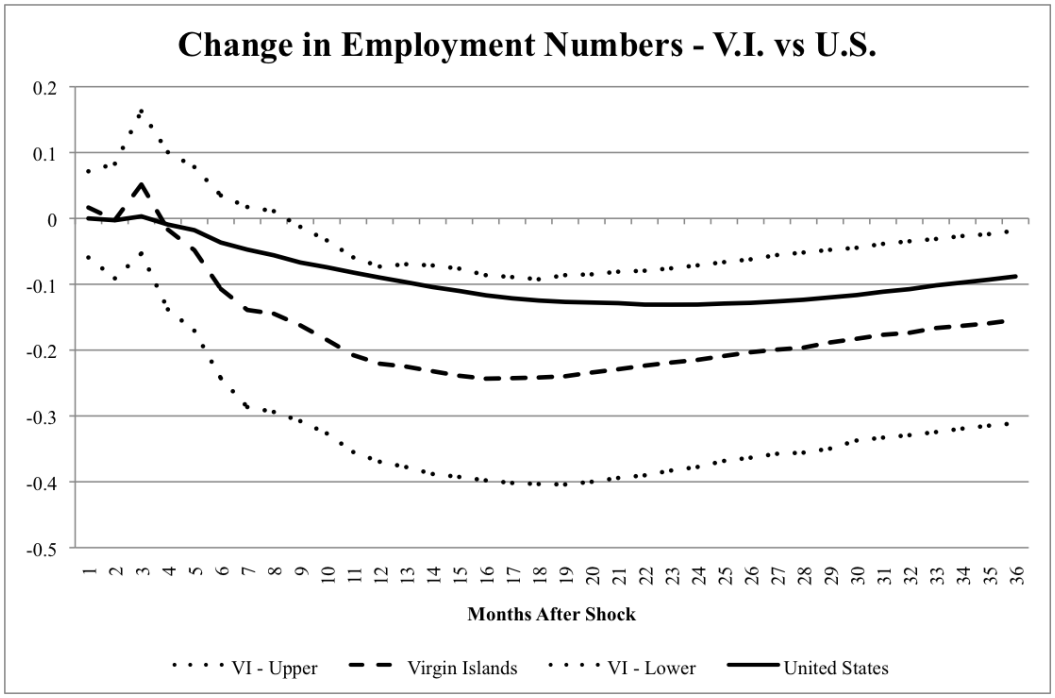

Figure 14. Impulse Response Functions to a Monetary Policy Shock – U.S. Virgin Islands and the United States.

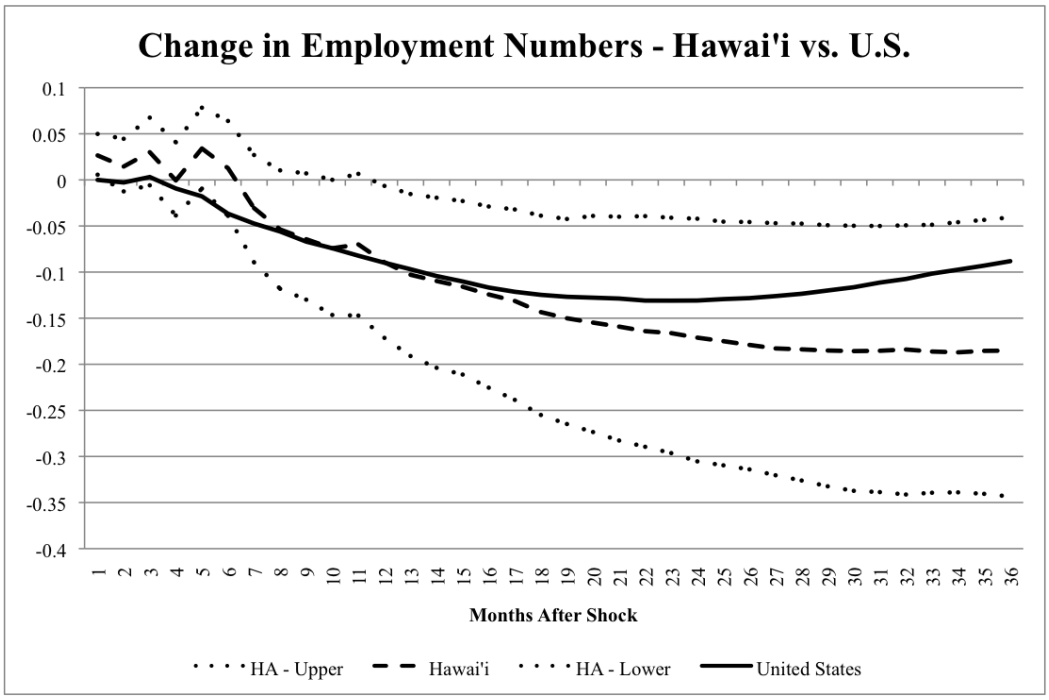

Figure 15. Impulse Response Functions to a Monetary Policy Shock: Hawai'i and the United States.

For regions that share the same business cycle, monetary policy should provide economic stabilization. However, if there are regional economic shocks generating dissimilar business cycles, then monetary policy will be destabilizing for some regions. This could be ameliorated through economic shock absorbers such as factor mobility, flexible prices, federal fiscal transfers, and a diversified economy. Absent these shock absorbers, these regions would find that a tightening of monetary policy would further destabilize its economy. Often these economic shock absorbers become important for the region to be a successful part of an OCA, particularly when the region's business cycle is unlike the rest of the currency union[20] (Beckworth 2010). Some of these shock absorbers are present in the Puerto Rican economy,[21] while others are not.[22]

[20] Which Puerto Rico appears to be.
[21] Federal fiscal transfers and factor mobility.
[22] A diversified economy and flexible price.

A primary purpose of monetary policy is to eliminate or smooth the business cycle. As compared to the United States as a whole, the Puerto Rican economy exhibits larger scale reactions to U.S. monetary policy shocks. Disruptive outcomes from those monetary policy shocks can be anticipated. One implication of these results is that Puerto Rico is not part of the dollar OCA. However, there are some potential policy implications from these results.

Since negative shocks preclude negative movements in Puerto Rican employment, United States and Puerto Rican policy makers can anticipate that negative shocks will unfavorably impact the island's economy.[23] Models such as the VAR used in this chapter can be used to estimate job loss in Puerto Rico. The effects are felt almost contemporaneously and continue deteriorating for nearly two years, before slowly returning toward pre-shock levels. On average, the impact was still being felt three years later.

Though the relationships between economic variables are often complicated, the unique ties between the United States and Puerto Rico augur a tremendous amount of influence from the U.S. to Puerto Rico. In short, what happens at The Fed is felt in *La Fortaleza*.[24]

Conclusion

This chapter researched the relationship between an economy that exports its currency and one the imports its currency. Though Puerto Rico has no control over U.S. monetary policy, due to the close political and economical relationship, it is an important

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[23] Rodríguez (2004) argues that the impact from U.S. rate innovations can be followed closely enough that Puerto Rico can act to ensure growth despite any federal funds rate shocks.

[24] The Governor's mansion in San Juan.

factor influencing the Puerto Rican economy. While the specifics of how U.S. monetary policy affects the Puerto Rican economy does not necessarily transmit uniformly or predictably (Kicinski 2007), the empirical evidence presented in this chapter demonstrates that U.S. monetary policy has asymmetric affects on Puerto Rican employment figures. These results confirm that shocks to the U.S. Federal Funds rate can indicate future movements of Puerto Rican employment.

The Optimal Currency Area[25] theoretical framework is useful to determine whether Puerto Rico is best served by being dollarized because it provides criteria like economic openness, political commitment and financial integration (Swofford 2000). An example could include a situation where the Puerto Rican economy[26] is slowing down resultant from negative shocks to its primary industries. If the U.S. monetary authorities tighten because other regions of the economy are expanding too fast, then Puerto Rico needs price flexibility, labor mobility, and federal fiscal transfers in order to offset the effects of the contractionary monetary policy. Without these economic shock absorbers, tightening of monetary policy would further destabilize Puerto Rico.

Though small, the Puerto Rican economy is one of the world's most open (Lawrence and Lara 2006), with free mobility of goods, services, capital and labor (Collins, Bosworth and Soto-Class 2006). Puerto Rico is one of the earliest examples of development through integration to the world economy (Rivera-Batiz and Santiago 1996) and circa 1950 it was as one of the world's fastest-growing economies, considered a model of modernization (Annals 1953; Baer 1959) often compared to the East Asian

[25] Puerto Rican probably qualifies as a region in terms of OCA theory and monetary policy.
[26] Which is becoming *decreasingly* diversified (Vega-Rosado 2006).

"Tigers." As a result of Operation Bootstrap's early success, Puerto Rico was perceived as an example of an economically underdeveloped area's rapid development. Yet, none of this precludes the necessity of the above-mentioned shock absorbers, since Puerto Rico cannot ease monetary policy and engineer a competitive devaluation of its currency.

Monetary policy and its impact is an important variable when evaluating any economy. This work contributes to the study of this economic variable by investigating how U.S. monetary policy affects the Puerto Rican employment. Because the federal funds rate is a good indicator of monetary policy actions, it can help predict future movements of real macroeconomic variables (Bernanke and Blinder 1992). Towards this end, this essay presented a VAR model that included various economic variables: Puerto Rican, United States, Virgin Island and Hawaiian employment figures, U.S. Federal Funds Rate, U.S. Consumer Price Index, U.S. Industrial Production Index and the U.S. Producer Price Index. The VAR model used in this chapter suggests that Puerto Rico is not in the dollar OCA. The statistical tests yielded satisfactory results by illustrating how the Puerto Rican employment response to U.S. monetary policy shocks is significantly worse than the United States, the U.S. Virgin Islands and Hawai'i. In other words, according to the results obtained in this analysis, Puerto Rican employment is an economic variable that is influenced by the monetary policy of the United States.

Some further empirical work of this work would be advisable. Such studies would contribute to understanding the impact that U.S. monetary policy has on small, dollarized economies. Unites States monetary policy shocks clearly have both long term and short-term effects on the Puerto Rican economy, with a major affect on employment numbers. But, why does this happen? Is it a lack of a diversified economy? Does a required

federal minimum wage level like the mainland United States limit employment opportunities? Is it the low percentage of private enterprise or the high transfer payments? How does Puerto Rico's low employment-to-population ratio influence these results? Why does Puerto Rico have a worse reaction than the Virgin Islands, which is only 90 miles away and likewise closely tied to American economic fortunes? These are just a few recommendations for further research.

Some policy questions can include: What other factors are influencing the Puerto Rico employment data? What can be some rational expectations of U.S. monetary policy? What should policy makers in San Juan and Washington D.C. consider upon the onset of monetary policy shocks?

Puerto Rican employment, GDP, inflation, interest rates, consumer spending, investments and trade are all influenced by the United States Federal Reserve Bank's monetary policy actions. Any discussion regarding the Puerto Rican economy needs to take into account the Island's relationship with the United States and the dollarized status of the Puerto Rican economy (Kicinski 2007). Also, with the continued primacy of the U.S. dollar in the Americas and the regional economic integration initiated with NAFTA, the study of United States monetary policy is integral to an understanding of Caribbean and Latin American economies.

CHAPTER III

AVANCE STUDY FINDINGS –PERCEIVED ECONOMIC DEVELOPMENT BENEFITS FROM SEVENTH-DAY ADVENTISM IN PUERTO RICO.

"All men need the gods." Homer – The Odyssey, Book 3, Line 55

The chapter investigated the intersections of religion and economics; specifically how Seventh-day Adventists in Puerto Rico perceive the benefits of Adventism. The Seventh-day Adventist (SDA) church, founded, organized and headquartered in the United States of America, has a worldwide network of churches, schools, colleges, hospitals, clinics, media centers and development offices. This global reach presents an attractive research opportunity. Doctrines that may influence economic development, including an emphasis on healthful living along with organizations that promote educational attainment add to the appeal.

Religion's role in the public discourse is increasingly recognized (Steensland et al. 2000). Whether through symbols, pedagogy, rituals, preaching or discussion, religions shape member's concrete views on a wide range of social issues, including economic, (Wald, Owen and Hill 1988; Welch et al. 1993) in ways that often transcend social class, educational attainment, or other sociological factors (Leege and Kellstedt 1993; Davis and Robinson 1996; DiMaggio, Evans and Bryson 1996; Green, Guth and Smidt 1996; Wald and Calhoun-Brown 2007). There is sufficient rationale for development theorists and economists to accept religion's role on economic systems and its relevance on economic development (Nelson 2001; Barro and McCleary 2003; Mangeloja 2005; McCleary and Barro 2006).

This is not a study of religious economics – evaluating economic policies from a religious perspective - but research into how religion influences the behavior of individuals. Thus, Fox and Sandler's (2005) definition of religion, which focuses on five ways religion can influence society,[27] helped guide this research. Of particular significance is the second principle, which states that religion is a belief system that influences behavior. This sentiment is similar to Garner's (1998) argument that religious belief may enhance the prospects for economic development by encouraging attitudes and activities that are conductive to development. This opinion is not uncommon, as evidenced by Iannaccone's (1998) assertion that religious belief affects a wide range of behavioral outcomes. He reached this finding while evaluating approximately 200 papers on the economics of religion.

This chapter added to the conversation on the potential links between religion and economic development by using survey data from the Seventh-day Adventist Church in Western Puerto Rico and is outlined as follows. An overview of the religion and economics literature will be followed by an introduction to the Human Development Index, Puerto Rican history and economics and the Seventh-day Adventist Church. The theoretical framework will then be introduced and immediately followed by data analysis. Some possible implications and suggestions for additional research will conclude this chapter.

[27] According to Fox and Sandler (2005) religion can influence society (1) as a basis for identify; (2) as a belief system that influences behavior; (3) through formal religious doctrines; (4) as a source of legitimacy; and (5) through its religious institutions.

Literature Review

Religion and Economics

This chapter reflects the current literature in which researchers describe studies of economic attitudes and argue of religious beliefs and development being inextricably linked (White and Tiongco 1997). Swager (2000) writes that economic development must include a spiritual dimension (Figure 16), while Guiso, Sapienza and Zingales (2003, 1) found that "on average, religious beliefs are associated with 'good' economic attitudes, where 'good' is defined as conducive to higher per capita income and growth" and "that [overall] Christian religions are more positively associated with attitudes conducive to economic growth." This finding is similar to Barro and McCleary's (2003, 779), where they found "causal influences from religion to economic growth" and that "stronger religious beliefs stimulate growth because they help sustain specific individuals that enhance productivity." McCleary (2007, 50) goes as far as to argue that "religion contributes to economic growth by providing people with … beliefs" that are conducive to positive economic outcomes. Most recently, Traunmuller (2009) found evidence of a double positive effect of Protestantism, where Protestants tend to be more trusting and that a Protestant context increases trust, regardless of individual religious belief.

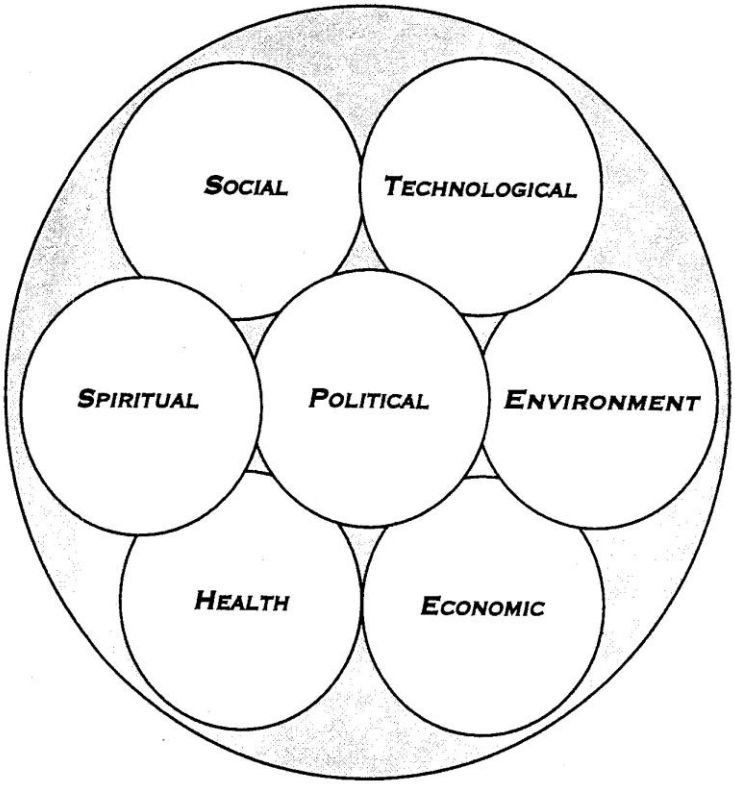

Figure 16. Dimension of Economic Development (Swager 2000).

Not everyone agrees with the positive link between religion and economics. Fanfani (1936) argued that all religion has a negative effect on development with Beed and Beed (1996) echoing that secular economics seem to contradict several essential Christian beliefs. Wallerstein (1980, 1989) thinks the religion and economics relationship is likely to be one in which economics is the cause and religion the effect. With religion no longer fulfilling any important social function in modern society (Harper 2000), Sanderson and Loucks assert (2004) that there is no reason to presume a causal connection between religion and economic development.

The subject of religion and economics far pre-dates the above-cited scholars. With its themes of the universal common good and global civil society, Thomas Aquinas' *De Regno (De Regimine Principum) ad Regem Cypri* (1267) and *Summa Theologica* (1265–

72), where Aquinas argued for the Christian commitment to progress (Stark 2005), were antecedents to the economic concern with religion and development. Adam Smith, in *Theory of Moral Sentiments* (1759), wrote that religious beliefs provide strong incentives for individuals to follow moral structures – structures that often support economic growth. He wrote that our conscience is something innate and that people are born with a moral sense that is not provided by laws or by rationality. This same "invisible hand," Smith would argue, also creates beneficial social patterns out of our economic actions. Smith extended economic reasoning to an analysis of religious behavior in his *Wealth of Nations* (1776). Later Max Weber's *Die protestantische Ethik und der Geist des Kapitalismus* (1904) theorized that religion might be a significant positive or negative force on economic development. Weber argued that the Protestant Reformation paved the way for modern capitalism by highlighting the value of individual responsibility, personal diligence, approved risk-taking and financial self-improvement.

Heaven and salvation, hell and damnation and other supernatural rewards are great motivators of behavior in this world (McCleary and Barro 2006). Thus a key principle in the Weberian ethos is that religious beliefs, though not necessarily participation in organized religion, are critical for economic outcomes. Weber viewed religiosity as an independent variable capable of influencing economic results (McCleary 2007) by promoting work ethic, honesty, trust and thrift.

With the principal forms of Protestantism descending from his ideas, John Calvin was vital to the Protestant Reformation zeitgeist (Bellouc 1928; Tawney 1952; Hooker 1999). Historically positioned in the early stages of modern economic development, Calvin reflected on the Genesis account regarding human origins and noted that the Lord placed

all of creation, including its wealth, in man's care, thus assigning human stewardship to economic matters. The Biblical archetype of *imago dei* (created in God's image) found in Genesis 1 suggests that man is capable of creating, allowing man to utilize God's abundance towards growing wealth. Along with this abundance came responsibility and a mandate for wise stewardship, which could help explain why for centuries after the Reformer's death wealth development occurred wherever Calvinists made their homes (Hall and Burton 2009). Calvinist thought also provided a theological basis for private property, largely missing in other cultures (Stark 2005) and the doctrines of thrift and hard work later influenced Adam Smith (Skousen 2006).

Calvin believed that economic success and religious faith evidenced that an individual had been chosen for salvation, as opposed to the medieval church's suspicion of the economic motive and condemnation of commerce. Attitudes toward commerce began to change as "Calvinism endowed the life of economic enterprise with a new sanctification" (Tawney 1952, 37), by accepting a commercial civilization and providing a creed to the business and merchant class (Nelson 2001). Protestant economic contributions, like the doctrine of man's duty to develop wealth, clergy support for capital markets, the belief that technological progress was a blessing, that long-term investments are not to be discouraged and thinking multigenerationally are often considered products of Calvinism (Belloc 1928; Stark 2005; Hall and Burton 2009). This stood in stark contrast to Luther's outlook on business enterprises as the "very essence to the kingdom of darkness" (Tawney 1952, 84) that saw no reason for the business classes in a Christian society.

A primary precept of Calvinism sought to inculcate religion into all areas of life and any area of work, including business, could be a calling from God; as valid and sacred as clergy. Calvinism taught that God values all work and is a part of His providential calling (Stark 2005; Hall and Burton 2009) thus liberating economic energy (Tawney 1952) and paving the way for modern, market-based business practices. With few theologians connecting economic philosophy with the divine quite this way, this new commercial tradition is among Calvinism's most enduring contributions (Bieler 1959; Hall and Burton 2009).

Despite these histories and the existing literature, economic development theory and practice has typically avoided engagement with religious discourse and often discounted its role (Sweetman 1999; Harper 2000; Ver Beek 2000; Selinger 2004; Fox and Sandler 2005; Tomalin 2006). Wolfe (2006, 9) writes that, "For much of the postwar period, academic disciplines, including the social sciences, ignored religion, despite the fact that giants of social-scientific discovery such as Weber and Durkheim made the subject central to their understanding of the world …the role of religion in promoting Western capitalism has been underestimated."

United Nations Development Programme's (UNDP) Human Development Index (HDI)

To help measure perceived economic development by SDA members in Western Puerto Rico, the theoretical framework of this chapter is the United Nations Development Programme's (UNDP) Human Development Index (HDI) and the three components it utilizes to measure economic development: income, longevity, and education (United Nations Development Programme 2009a).

Since 1990, the Human Development Reports have published the Human Development Index, a composite measure of human development, which has become one of the most widely discussed measures of the impact of economic development on well-being (Crafts 1999). It was felt that a summary measure is needed to supplement gross domestic product (GDP) per capita (Fukuda-Parr 2001), thus the UNDP launched the Human Development Index as a measure of the level and standard of living in cross-country comparisons to accompany the usual measures of gross national product (GNP) or GDP, (Low and Aw 1997) which have traditionally had a singular influence on development economics. This is significant because while poverty can be alleviated at quite low-income levels, high average incomes do not automatically safeguard the general populace from poverty (Streeten 2000). Quality of life can vary greatly between countries with similar levels of per-capita GNP and real income (Anand and Sen 2000b). The Human Development Programme uses a comparison of Costa Rica and Iran as an example of the HDI's utility. While both countries have the same level of income per person, their HDI levels are vastly different due to Costa Rica's much higher life expectancy and literacy rates (United Nations Development Programme 2009b). This is because the HDI endeavors to measure development in terms of health, education and other facets of life not measured by GDP.

Out of all the data and measures used and disseminated in the Human Development Reports, it is the HDI that has generated a great deal of public attention and policy impact. This is evidenced by the importance given by nations to their ranking in the Human Development Index. HDI and the ranking of countries continues to stimulate

debate and action on more effective policies to promote human well being – from education, health, equity, gender equality, etc. (Fukuda-Parr 2001).

According to the United Nations Development Programme (United Nations Development Programme 2001, 3) the HDI was created:

- "To capture the attention of policy makers, media and NGOs and to draw their attention away from the more usual economic statistics to focus instead on human outcomes, not economic data."
- "To re-emphasize that people and their lives should be the ultimate criteria for assessing the development of a country, not economic growth."
- "To question national policy choices - asking how two countries with the same level of income per person can end up with such different human development outcomes (HDI levels)."
- "To highlight wide differences within countries, between provinces or states, across races, language or religious groupings. Highlighting internal disparities along these lines has raised national debate in many countries."

Before the HDI itself is calculated, an index needs to be created for each of these dimensions. To calculate these dimension indices - the life expectancy, education and GDP indices - minimum and maximum values (goalposts) are chosen for each underlying indicator. Performance in each dimension is expressed as a value between 0 and 1 by applying the following general formula:

$$\text{Dimension Index} = \frac{\text{Actual Value - Minimum Value}}{\text{Maximum Value - Minimum Value}}$$

The HDI is then calculated as a simple average of the dimension indices (United Nations Development Programme 2001).

The initial Human Development Report read that "The basic objective of development is … for people to enjoy long, healthy and creative lives … a simple truth often forgotten in the immediate concern with the accumulation of commodities and financial wealth" (United Nations Development Programme 1990, 9). It was also felt that "attention [solely] on GNP per capita had seen too few positive results" (Wherry, 2004, 158). A measure was needed to assess the development of a country and not just economic growth by not focusing exclusively on traditional economic measures but including individual outcomes (United Nations Development Programme 2009b). ul Haq (1995,47) writes that the index "measure[s] at least a few more choices besides income and ~~to~~ reflect[s] them in a methodologically sound composite index."

Thus, the Human Development Index is a quality of life index of a country's citizens (Miller and Salkind 2002) and it seems to serve well as an approximation to collective human development in an economy (Sun 1997). There has been widespread use of the HDI as a measure of economic development (Crafts 1997a). The HDI has been designed to facilitate long-run comparisons and measures the distance covered from minimum to maximum development in terms of income, longevity, and education (Crafts 1999). While it is a summary measure of human development and not a comprehensive measure (United Nations Development Programme 2001), it is probably the most common standard measure of human development (Ivanova and Arcelus 1999). The HDI has been used as a tool to argue the reformation of globalization (Mandle 2001), to measure the impact of modernization and industrialization (Lieten 2002), to measure cross-country

divergence in standards of living over a fairly long period of time (Mazumdar 2002) and to evaluate the process of development in emerging economies (Adams 2000).

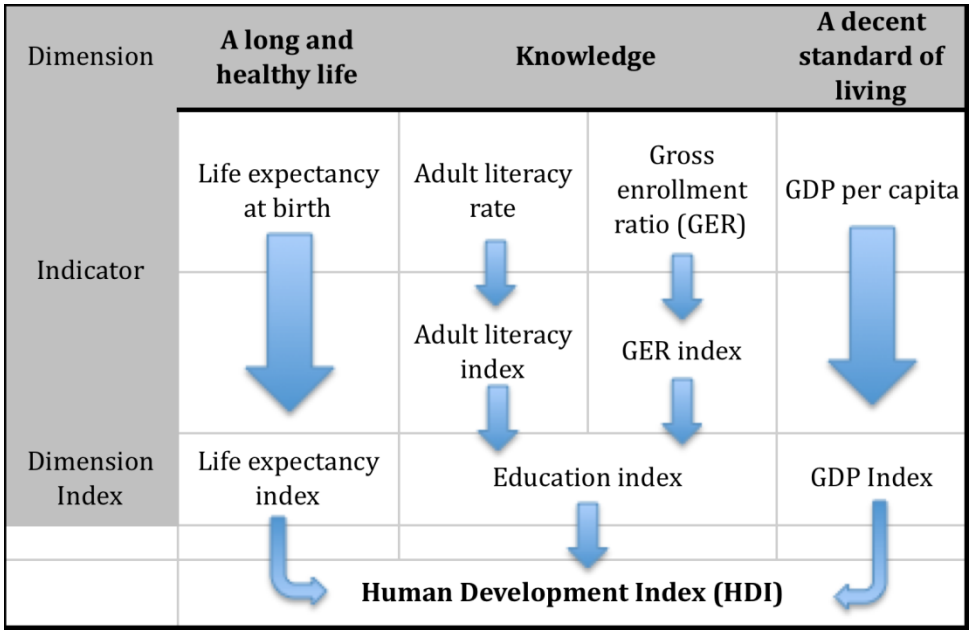

Figure 17. How the Human Development Index is calculated.[28]

Because they are fundamental, universal and measurable, the HDI focuses on income, longevity, and education (Fukuda-Parr 2001). Education often has a positive impact on standards of living and life expectancy (Mushkin 1962), and is important because the consensus is that human resource development has considerable influence on economic growth and development (World Bank 1993, 1995). Life expectancy is a recognized measure of development (Todaro and Smith 2009) and a decent living standard acknowledges that there are many basic needs dependent on economic circumstances. Income levels, particularly those close to poverty lines, is crucial information to monitor basic human capabilities (Anand and Sen 2000a).

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[28] Source: *Human Development Report 2001: Making New Technologies Work for Human Development*, page 239. Copyright 2001.

Despite it generally universal acceptance, the HDI does have its detractors and critics. Some have said that the HDI understates well-being, while others say that it overstates it (Streeten 2000). Even though the focus of HDI is on the escape from poverty, income is assumed to make sharply diminishing returns above a certain level, eventually tailing off to nothing (Crafts 1999). Others feel that although the simplicity of the Index is appealing, the HDI and the indicators on which it is based need a good deal of further work. This is mainly because the concept of human development is much broader than anything that can be captured by an index. Critics have also said that not only are the weights of the three components arbitrary, but so are what is excluded and what is included. The HDI neglects the existence or absence of civil and political freedom, the respect for human rights, the presence of violence and the degree of security enjoyed by the people (Streeten 2000).

Though the HDI may not represent each and every individual development factor, it does appear to reflect a good degree of collective human development (Sun 1997). The HDI serves as a reminder that economic development is not merely raising output or income, but also enlarging human choices and enriching human lives (Low and Aw 1997).Despite criticisms, an important part of the Human Development Reports has been the use of indicators to monitor human development. The Human Development Index (HDI) is well known and has attracted a great deal of public attention in the media and among politicians. This attention is but part of a larger endeavor to encourage debate on human development issues; a debate that would be informed by quantitative evidence (Fukuda-Parr 2001). The HDI reminds us that economic development includes enlarging

human choices and enriching human lives, not just raising output or income (Low and Aw 1997).

Puerto Rico

There are academic attractions in choosing Puerto Rico as the geographical area under study. While concluding that the Puerto Rican development model placed the island among the world's top performers during 1950–90, Baumol and Wolff (1996) placed Puerto Rico in an international context and argued that the Puerto Rican experience held valuable lessons for emerging economies. With one of the most dynamic economies in the Caribbean region (Vega-Rosado 2006), Puerto Rican economic development invites investigation from United States economists (Baumol and Wolff 1996) and Puerto Rico is a case of legitimate interest to development scholarship (Padin 2003). Puerto Rico represents one of the earliest examples of development through integration to the world economy, thus should be of special interest (Sotomayor 2004) and as an island it possesses an isolation that provides a natural research laboratory.

Located at the eastern end of the Caribbean Sea, the island of Puerto Rico was discovered on November 19, 1493 during Christopher Columbus' second voyage. Ponce de León began the Spanish colony of the island in 1508 and thus it remained as a heavily fortified strategic location at the eastern end of the Spanish colonial empire until 1898 (Maldonado-Denis 1972; Wagenheim 1975; Carr 1984; Morales-Carrion 1984; Fitzpatrick 1987; Pico 2006).

Formally ceded by the Treaty of Paris after the Spanish-American war, Puerto Rico became an American possession on December 10, 1898. The 1917 Jones Act granted United States citizenship to Puerto Ricans and provided for the popular election to both

houses of the legislature. However, appointing the governor remained the provenance of the President of the United States. The U.S. Congress amended the act in 1947, granting Puerto Ricans the right to elect their own governor. Luis Muñoz Marín became Puerto Rico's first democratically elected governor, taking office in January 1949. Today, Puerto Rico's political status is called the Free Associated State of Puerto Rico. Fashioned under the leadership of Muñoz Marín, this provided for the increased autonomy of the island and established a relationship between Puerto Rico and the United States similar to commonwealth status (Maldonado-Denis 1972; Wagenheim 1975; Carr 1984; Morales-Carrion 1984; Fitzpatrick 1987; Pico 2006).

Since 1917 Puerto Ricans have been American citizens, yet nearly half of Puerto Rico's residents live below the U.S. poverty line with the income gap relative to the mainland widening, thus Puerto Rico remains significantly less prosperous than even the poorest U.S. state (Collins, Bosworth and Soto-Class 2006; Bram et al. 2008). United States government transfer payments are a large portion of Puerto Rican resident's income, providing approximately one-fourth of Puerto Rican personal income (Burtless and Sotomayor 2006). Nevertheless, it has a per capita income substantially higher than the rest of Latin America and Puerto Rican quality-of-life measures such as literacy rates, years of schooling and life expectancy are closer to the most highly developed countries. Puerto Rican education levels exceed the most educated Latin American nations (Collins, Bosworth and Soto-Class 2006), though in low-income families student dropout rates are very high (Ladd and Rivera-Batiz 2006).

Though small, the Puerto Rican economy is one of the world's most open (Lawrence and Lara 2006), with free mobility of goods, services, capital and labor (Collins,

Bosworth and Soto-Class 2006). Puerto Rico is one of the earliest examples of development through integration to the world economy (Rivera-Batiz and Santiago 1996) and circa 1950 it was as one of the world's fastest-growing economies, considered a model of modernization (Annals 1953; Baer 1959) often compared to the East Asian "Tigers." As a result of Operation Bootstrap's early success, Puerto Rico was perceived as an example of an economically underdeveloped area's rapid development.

However, this chapter is particularly interested in the cultural and historical factors that make Puerto Rican an interesting case in regards to the intersections of religion and economics. With their four hundred year shared history, language and religion, Spanish culture dominates Puerto Rican behavior (Spillan, Parnell and Singh 2007).

The Roman Catholic faith was exported to Puerto Rico with the 16th century conquest and became a Roman Catholic colony - an experience that produced cultural traditions penetrated by the Catholic faith. Thus religion, specifically Roman Catholicism, became the cultural support that came out of that historical background. Not unlike other countries founded by the Spanish empire, the religious values of the community are "deeply imbedded in the culture" and "it played a significant role in symbolizing the central values of the society" (Fitzpatrick 1987, 36).

Seventh-day Adventist Church

Between the 1790s and 1860, tens of thousands of Americans experienced religious conversion and joined evangelical churches. This Second Great Awakening left a lasting impression on the American social landscape, leaving behind established churches, democratization and social reform (McLoughlin 1978; Noll 1992).

"A hand-colored aquatint by M. Dubourg depicts a Methodist camp meeting held in North America, circa 1819. Camp meetings were a common event during the years of the Second Great Awakening." - The New Georgia Encyclopedia 2009

Figure 18. Methodist Camp Meeting, circa 1819

Beyond rising church membership, the Second Great Awakening ushered in new ideas, with Americans finding themselves increasingly enamored with the notion of choice. One result was that the idea of predestination[29] lost ground, as the doctrine of free will[30] gained ground. By the early 1800s, religious consumers had countless movements from which to choose (Johnson 2008). Social movements for temperance, abolition, feminism, peace, Utopian experiments, anti-Masonry and dietary reform flourished and new religious sects were founded (Brown 1952). Among those were Mormonism, Shakerism, Oneida Perfectionism and Seventh-day Adventism (Butler 1986).

Among the important elements of this 19th century revival was the idea of Millenarianism[31](Brown 1952; Neufeld 1976). Adding to the excitement was the

[29] Salvation dependent on God's predetermined decision.
[30] Salvation dependent on one's choice.
[31] Based on the 1,000 years (or millennium) of Revelation 20 and the Second Advent Movement, which emphasized the imminent return of Jesus Christ.

calculation by William Miller, a farmer and Baptist layman from Low Hampton, New York, that the world would end in 1843 with Christ's return[32] (Brown 1943).

Like many others, William Miller returned to belief in the Bible during the Second Great Awakening. What Miller added to the proceedings was a result of examining the Biblical prophetic time periods of Daniel and Revelation. Studying from 1816-1818, he concluded "that in about twenty-five years from that time all the affairs of our present state would be wound up [1843]" and Jesus Christ would return (Miller 1845).

Figure 19. Leonid Meteor Shower, November 1833 (Sydney Observatory 2006).

Starting in the early 1830s, Miller spread the message by circuit-riding through small New England towns with an illustrated series of lectures, which led to invitations to the larger cities. By 1840, he had triggered the most popular millenarian and Second Advent movement in American history (Butler 1986). Millerism and Adventism became household words in America (Knight 2004), aided by "an unprecedented media blitz" organized by Boston, Massachusetts Pastor Joshua V. Himes (Hatch 1989, 142). Natural

[32] This prediction fit the times with its emphasis on a literal Biblical translation.

phenomenon, like the Shower of Stars (Figure 19), the Great Comet, and the Dark Day, interpreted as ominous portents, increased the cacophony (Rowe 1985). Sermons, pamphlets, and books proclaimed that current events were a prologue to the millennium, with the prophetic periods of Daniel and Revelation coming to a close (Dederen 2000).

The Second Great Awakening has been described as a pivotal event in shaping the American man or the "new man" (McLoughlin 1978). With the importance of status diminishing and the common folk celebrated, Miller personified the "self-made Jacksonian man," and his alarming apocalyptic prediction captivated both the common and the elites (Rowe 1985, 35).

Figure 20. William Miller (Ohio History Central 2005).

Miller was not alone in his conclusions from studying the prophetic messages of Daniel and Revelation. Contemporary Bible scholars from around the globe wrote and spoke of the imminent Second Advent and concluded that the prophetic time periods were coming to an end (Dederen 2000).Though Miller initially rejected specifics

regarding the exact time of the Second Advent, by January 1843 he hypothesized that Christ would return sometime between March 31, 1843 and March 31, 1844 (Knight 2004). Miller's year passed without Christ's return.

The Millerites were disappointed, yet the movement continued. Events in August 1844 breathed new life into the movement. At a camp meeting in Exeter, New Hampshire, Millerite minister S.S. Snow convincingly demonstrated that Christ would return on October 22, 1844. Realizing they had only about two months to warn the world of the imminent Second Advent and its attendant ruin and destruction, the Millerites mounted a final effort (Spalding 1961; Maxwell 1977; Knight 2004).

By the maple grove beside his house in Low Hampton, New York, friends of Miller assembled on what is known today as Ascension Rock to await the Second Advent (Maxwell 1977). October 23, 1844 found the Millerites again disappointed and the once fairly congruent movement dissolved into chaos. Among the remaining Millerites, conflicting views and explanations regarding the recent events and the "truth" about the Second Advent competed for pre-eminence. This "seething cauldron and shapeless mass of discouragement and confusion" (Knight 2004, 26) were the origins of, among other sects, the Seventh-day Adventist Church (Sweet 1930; Butler 1986; Knight 2004).

Figure 21. Ascension Rock (Ascension Rock Panorama 2007).

The SDA Church is "the most significant institutional outgrowth of the Millerite movement" (Butler 1991, 4). This Millerite progeny became an established denomination emphasizing sabbatarianism, eschatology, health reform, temperance, and religious liberty. During its 150-year history, the church has established a global network of medical institutions and an educational system unparalleled in contemporary Protestantism (Butler 1991).

This evolution from disenfranchised apocalyptic movement to established denomination was not guaranteed. Many early Sabbath-keeping Adventists opposed denominational organization above the congregational level on theological grounds. Some of this resistance resulted from many Millerites having been cast out of their previous churches because of their beliefs and feared that church organization could become autocratic (Maxwell 1977; Knight 2004).

THE PRESENT TRUTH.

PUBLISHED SEMI-MONTHLY—BY JAMES WHITE.

Vol. I. MIDDLETOWN, CONN. JULY, 1849. No. 1.

"The secret of the Lord is with them that fear him; and he will show them his covenant."—Ps. xxv. 14.

"WHEREFORE, I will not be negligent to put you always in remembrance of these things, though ye know them, and be established in the PRESENT TRUTH." 2 Pet. i: 12.

It is through the truth that souls are sanctified, and made ready to enter the everlasting kingdom. Obedience to the truth will lell us to this world, that we may be made alive, by faith in Jesus. "Sanctify them through thy truth; thy word is truth." John xvii: 17. This was the prayer of Jesus. "I have no greater joy than to hear that my children walk in truth." 3 John iv.

Error, darkness and fetters the mind, but the truth brings with it freedom, and gives light and life. "Free charity, or LOVE, "rejoiceth in the truth." Cor. xiii: 6. "Thy law is the truth." Ps. cxix: 142.

David describing the day of slaughter, when the penitents shall walk in darkness, and destruction waste at noon-day, so that, "a thousand shall fall at thy side and ten thousand at thy right hand," says—

"He shall cover thee with his feathers, and under his wings shalt thou trust; his TRUTH shall be thy SHIELD and BUCKLER." Ps. xci: 4.

The storm is coming. War, famine and pestilence are already in the field of slaughter. Now is the time, the only time to seek a shelter in the truth of the living God.

In Peter's time there was present truth, or truth applicable to that present time. The Church have ever had a present truth. The present truth now, is that which shows present duty, and the right position for us who are about to witness the time of trouble, such as never was. Present truth must be oft repeated, even to those who are established in it. This was needful in the Apostles day, and it certainly is no less important for us, who are living just before the close of time.

For months I have felt burdened with the duty of writing, and publishing the present truth for the scattered flock; but the way has not been opened for me to commence the work until now. I tremble at the word of the Lord, and the importance of this time. What is done to spread the truth must be done quickly. The four Angels are holding the angry nations in check but a few days, until the saints are sealed; then the nations will rush, like the rushing of many waters. Then it will be too late to spread before precious souls, the present saving, living truths of the Holy Bible. My spirit is drawn out after the scattered remnant. May God help them to receive the truth, and be established in it. May they haste to flake shelter beneath the "coming of Almighty God," is my prayer.

The Weekly Sabbath Instituted at Creation, and not at Sinai.

"And on the seventh day God ended his work which he had made; and he rested on the seventh day from all his work which he had made. And God blessed the seventh day, and sanctified it: because that in it he had rested from all his work which God created and made." Gen. ii: 2, 3.

Here God instituted the weekly rest or Sabbath. It was the seventh day. He BLESSED and SANCTIFIED that day of the week, and no other; therefore the seventh day, and no other day of the week is holy, sanctified time.

God has given the reason why he blessed and sanctified the seventh day. "Because that in it he had rested from all his work which God had created and made." He rested, and set the example for man. He blessed and set apart the seventh day for man to rest from his labor, and follow the example of his Creator. The Lord of the Sabbath said, Mark ii: 27. "The Sabbath was made for man." Not for the Jew only, but for MAN, in its broadest sense; meaning all mankind. The word man in this text, means the same as it does in the following texts. "MAN that is born of a woman is of few days and full of trouble." Job xiv: 1. "MAN lieth down and riseth not, till the heavens be no more." Job xiv: 12.

No one will say that man here means

Figure 22. First issue of *The Present Truth* – July 1849 (Sedona Observer 1999).

In the early 1850s, continued growth of the movement produced concerns with the "gospel order" (church organization), as there was no system of clergy ordination, fund gathering and distributing and no legal organization for holding property. This last concern resulted from the expansion of publishing efforts. Publishing had become a significant enterprise, establishing the first Adventist institution, a publishing house in Battle Creek, Michigan. Concerns with ownership of the publishing properties pushed early Adventists toward a more formal and legal organizational structure. Church pioneers James and Ellen White founded the publishing house with the magazine *The Present Truth*[33]in 1849 (Spalding 1961; Knight 2004). Since the group of believers had no legal organization, James White personally owned the press. It was suggested that the church should form an association that could be legally incorporated to own property. This was a common approach in contemporary American Christianity to organize evangelistic and benevolent associations separately from denominations (Maxwell 1977).

A "general conference" was called by leading ministers for September 28 to October 1, 1860. Despite strong opposition, it was decided to incorporate the publishing house and the name "Seventh-day Adventist" was adopted as best representing the beliefs of the nascent denomination – "observance of the Sabbath as holy and confidence in Jesus' imminent second advent" (Dederen 2000, 1). May 3, 1861 found the incorporation of the Seventh-day Adventist Publishing Association under the laws of the state of Michigan and in October the Michigan Conference of Seventh-day Adventists was formed (Knight 2004).

[33] Still in print today as the *Adventist Review.*

The final step in the development of church organization occurred at a Battle Creek meeting of church representatives. On Thursday, May 21, 1963 formal organization was sanctioned (Maxwell 1977) and the General Conference of Seventh-day Adventists was formed (Knight 2004). The Adventists grew from a small group of about 100 in the aftermath of the "Great Disappointment," to 200 members in 1850, to a membership of 3,500 at their formal organization in 1863 (Gaustad 1976).

After doctrinal and organizational concerns were sorted, lifestyle issues, particularly health reform, became the next step in Adventism's development[34] (Knight 2004). Though health reform was part of Adventist theology by 1865, it was not a uniquely Adventist cause; there was a larger contemporary health reform movement in the United States (Butler 1986). An impetus for this development was an epidemic of illness among church leaders that led to the adoption of "water cure" and vegetarianism (Spalding 1962).

The year 1866 saw the founding of the Western Health Reform Institute in Battle Creek, the first of what eventually would become a worldwide network of SDA health-care institutions. In 1876 John Harvey Kellogg was hired as chief administrator of the Western Health Reform Institute and within a few months Kellogg changed the name to Battle Creek Sanitarium (Spalding 1962; Knight 2004). Under Kellogg's guidance, Battle Creek Sanitarium achieved universal recognition and became the largest institution of its kind. Health reform and health care began their ascendency as integral parts of Adventist ministry.

[34] Adventism's entry into medicine was as influential on SDA organization as anything else (Butler 1986).

Today, the Adventist church is considered "a conservative Protestant body of evangelical Christians … known for their Sabbath observance[35], for their emphasis on maintaining health as part of religious duty and for their mission activities around the world" (Dederen 2000, 1). The SDA church has a four level organizational structure with authority coming from local church membership. The four levels, as outlined in the SDA Website (2009, n.p.) are as follows:

1. "The local church made up of individual believers."
2. "The local conference, or local field/mission, made up of a number of local churches in a state, province, or territory."
3. "The union conference, or union field/mission, made up of conferences or fields within a larger territory (often a grouping of states or a whole country)."
4. "The General Conference represents the worldwide expression of the Seventh-day Adventist Church."

Since 1989, the General Conference has been located in Silver Spring, MD,[36] housing the church administration. For administrative purposes, the worldwide church has been divided into 13 divisions, made up from churches grouped by a collection of missions, fields, or states into unions of churches. The Divisions with their headquarters:

1. East-Central Africa - Nairobi, Kenya
2. Euro-Africa - Berne, Switzerland
3. Euro-Asia - Moscow, Russia
4. Inter-American - Miami, United States of America
5. North American - Silver Spring, United States of America

[35] Sundown Friday until sundown Saturday
[36] Outside Washington D.C.

6. Northern Asia-Pacific - Koyang City, Korea.
7. Southern Africa-Indian Ocean - Harare Zimbabwe
8. South American - Brasilia, Brazil.
9. South Pacific - Wahroonga, Australia.
10. Southern Asia - Tamil Nadu, India.
11. Southern Asia-Pacific - Cavite, Philippines.
12. Trans-European - St. Albans, England.
13. West-Central Africa - Abidjan, Cote d'Ivoire.

Figure 23. SDA Church World Divisions.[37]

The Seventh-day Adventist Church world statistics[38] as of December 31, 2008 can be seen below:

[37] Source: General Conference of Seventh-day Adventist Website, Copyright 2008.
[38] Source: General Conference of Seventh-day Adventist Church World Church Facts and Figures, Copyright 2010.

- Churches 65,961
- Companies 62,430
- Church Membership 15,921,408
- Ordained Ministers, Active 16,615
- Total Active Employees 205,083

- Countries and Areas of the World as Recognized by the United Nations - 232
- Countries and Areas of the World in Which SDA Work is Established - 203

Educational Program

- Tertiary Institutions - 111
- Secondary Schools - 1,678
- Primary Schools - 5,763
- Total Enrollment - 1,545,464

Healthcare

- Hospitals and Sanitariums - 171
- Clinics and Dispensaries - 429

Contributions - In U.S. Dollars

- Tithe - $1,929,768,053
- Tithe Per Capita - $125.24
- Total Tithe and Offerings - $2,627,027,513
- Total Tithe and Offerings Per Capita - $170.50

Seventh-day Adventist Church in Puerto Rico

The history of the SDA church in Puerto Rico begins with the Spanish Constitution of 1869 that allowed a small degree of religious liberty. It read - "If some Spaniards profess another religion than Catholic, all that is provided in the former paragraph [guaranteeing freedom of religion] is applicable to them." The 1876 Constitution confirmed this by providing non-Catholics with religious toleration as long as they upheld public morality and did not display their faith publicly (Hughley 1991, 486).

Though it has been argued that the evangelical movement in Puerto Rico dates back to 1860 (Cabrera 1923, Bidot 1949) with the conversion of Antonio Bandillo, in 1868 Johanes Waldemar Zaccheus, a British immigrant to Vieques, began observing Anglican services. He then took the opportunity afforded by the 1869 Spanish constitution to open

a Protestant school for English-speaking children. The January 1873 consecration of an Anglican church in Ponce, established the first Protestant church in Puerto Rico (Vega 1993). However, it was the arrival of American troops in 1898 that fully introduced the island to this new religious and cultural dynamic.

Adventism was introduced to Puerto Rico and the Caribbean with the distribution of SDA literature. Starting in Haiti in 1879, by 1890 various colporteurs had made their way to the Caribbean. However, those territories under Spanish rule, like Puerto Rico and Cuba, remained closed to SDA proselytization (Haysmer 1924).

Despite these initial difficulties, on April 11, 2008, the Seventh-day Adventist church in Puerto Rico commemorated their 110th anniversary. David Trail, an American soldier and a Seventh-day Adventist, settled in Las Marias after the United States won the Spanish-American War. Trail wrote to the Seventh-day Adventist headquarters requesting that a missionary be sent to Puerto Rico and upon receiving his letter in 1901, SDA leadership sent Albert Fisher to Puerto Rico, officially beginning the island's SDA presence. After a brief stint in the capital, San Juan, they moved to Mayagüez, on Puerto Rico's West Coast (Vega 1993).

Figure 24. An SDA Church in Carolina, Puerto Rico (Google Photos 2010).

As a result of Mr. Fisher's passing, the SDA General Conference sent B.E. Connerly to continue the work. In April 1903, Connerly published the *El Centinela de la Verdad*[39], the first Protestant publication in Puerto Rico. On Saturday, December 17, 1904 the first Adventist church was organized in Mayagüez, PR with three members. The official Puerto Rican Mission was established in 1909, which included the Dominican Republic and the Virgin Islands. Today, with approximately 37,000 members, 300 churches, 12 high schools, two radio stations, two medical clinics, a university and a hospital, the Seventh-day Adventist church is well-established in Puerto Rico (Seventh-day Adventist Church Inter-American Division 2009) and is part of the Inter-American Division, as seen in Figure 25 below.

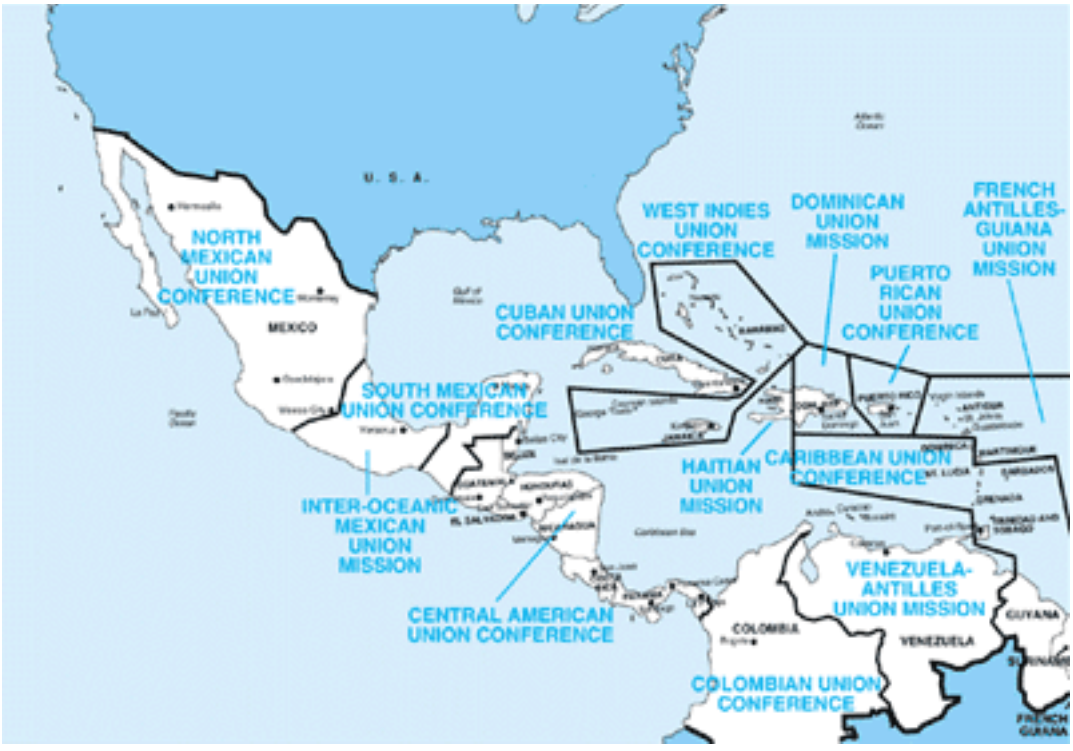

Figure 25. SDA Inter-American Division.[40]

[39] Which is still in print as *El Centinela*.
[40] Source: General Conference of Seventh-day Adventist Website, Copyright 2008.

Whether in the United States, Puerto Rico or elsewhere, SDA doctrines include a holistic aspect that includes not just traditional Christian beliefs, but also lifestyle teachings, recognized as the "Health Message." This component of the faith could have a positive impact on life expectancy through more healthful living.

In concert with the denomination's health efforts, its global educational system includes 7,600 schools, colleges and universities, with approximately 81,000 teachers and 1,500,000 students (GCSDA 2008). The SDA school system is considered to be the second-largest private school system in the world, second only to the Roman Catholic school system (Paulsen 2008). This focus on education is often vital to Adventism's missionary efforts.

In his research of Adventist missionary efforts, Lawson (1998) found that new Adventists have experienced widespread economic advancement and that recent proselytes were often drawn to Adventism because it is believed to offer development opportunities; this despite that a principal Adventist doctrine is the imminent return of Jesus Christ and its attendant ending of the world. Because of Adventism's tendency to make education a keystone of their evangelization[41] (Lewellen 1979) and give a high priority to developing schools, new members are attracted to the upward mobility often afforded by a formal education (Stoll 1990; Lawson 1998).

Along with providing a central clearing house for church statistics such as membership, baptisms, tithe receipts and institutions, the centralized form of church governance used by the SDA church generally eases access to many individual congregations and institutions. The church's universally recognized (that is, among SDA

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[41] Literacy is essential if people are to read the Bible.

members) 28 “Fundamental Beliefs” has developed a community around familiar values, perspectives, practices and beliefs (Durkheim 1912/2001; Gustafsson 1997; Henslin 2002).

Among these Fundamental Beliefs is the doctrine of the “The Gift of Prophecy” (#18), which in Adventist cosmology was manifested in the ministry of Ellen G. White (1827-1915). According to SDA theology, she is considered the Lord’s messenger and her writings are an authoritative source of truth (GCSDA 2010). Along with her husband, James, and retired ship captain Joseph Bates, she was part of early Adventism’s leading triumvate (Butler 1986) and she would become instrumental in the origins of this major American sect (Numbers 2008). Though not as recognized as Joseph Smith (Latter-day Saints), Ann Lee (Shakers), or Mary Baker Eddy (Christian Science) (Butler 1991), White’s writings number over 100 printed volumes and through the continuing efforts of the SDA church, she has become the most translated woman writer and the most translated American author (White Estate 2000).

Along with White’s deliberations on sabbatarianism, eschatology, health reform, temperance, medicine, child nurture, education and religious liberty, her writings include numerous economic observations. When writing about the benefits of country living over city living, White wrote that the “sense of being owners of their own homes would inspire them with a strong desire for improvement ... their children would be educated to habits of industry and economy … they would feel that they are men, not slaves, and would be able to regain to a great degree their lost self-respect and moral independence” (White 1952, 373). Incapable of escaping Calvin, she wrote that “Religious duty and the highest human prudence in business lines must be co-mingled (381)” and “Obedience to

God's law is the great incentive to industry, economy, truthfulness, and just dealing" (489). In counsel to businessmen she prompted them to do their business in a manner that would glorify God and to be diligent in their work (White 1888) and that a Christian's business is a part of his service to God (White 1903).

Studying the SDA church has other academic attractions. Bull (1989) contends, "Seventh-day Adventism is one of the most important religious movements native to the United States" and is the "most vital group to emerge from the debacle of the Great Disappointment" (177). Yet, it is often treated as a Millerism sidebar, receiving scant scholarly attention. Also, Seventh-day Adventism is a "New World" faith that makes an interesting comparison to the "Old World" faith that is the backbone of the Puerto Rican culture – Roman Catholicism. This empirical juxtaposition makes for a potentially more interesting comparison than merely using another "Old World" Christian tradition.

Methodology

Literature Review

Using National Opinion Research Center (NORC) General Social Surveys data, Tomes (1984) examined the effects of religions and denominations on earnings and returns to human capital. He found that, all other things being equal, there is virtually no evidence that religions denominational background has any influence on earnings. Lehrer (1995) used data from the 1987-1988 National Survey of Families and Households to explore how attitudes toward gender roles across religious groups may be translated into patterns of division of labor within the family and how women who enter into interfaith marriages may have incentives to make stronger commitments to the labor market, as intermarriages are known to be relatively unstable. Data from the 1987-1988

National Survey of Families and Households was used to investigate these two channels through which religion may influence the labor supply behavior of married women. The findings suggest that both of these effects are operative with religion playing a vital role in female labor supply decisions, particularly when household includes young children. Steen (1996) asked how religious and denominational background affects earnings and human capital investment. Using data from the National Longitudinal Survey Youth Cohort he found that, other things being equal, men raised as Catholics or Jews have higher incomes than men raised as Protestants.

Francis, Lankshear and Jones (2000) use a survey intrument to examine the influence of the charismatic movement on Anglican churches. Their results find that while the charismatic movement is associated with positive signs of church growth, it has rooted most securely in urban environments and least securely in rural environments. Cohen (2004) used Pew Global Attitudes Project survey data to explore the connection between economic perceptions and leader approval. His findings suggest that people will be prospective in their assessments of political leadership when they are fairly secure in their economic and political institutions. When they are uncertain, people will rely on retrospective assessments of their political leadership. Using data from the General Social Survey, Gruber (2004, 1) investigates the impact of charitable subsidies on religious participation, finding evidence that religious giving and religious attendance are substitutes. Specifically that, "larger subsidies to charitable giving lead to more religious giving, but less religious attendance, with an implied elasticity of attendance with respect to religious giving." Daniels and Ruhr (2005) utilized individual survey data from a national identity survey of U.S. residents to test the impact of religious affiliation on

attitudes toward trade and immigration policies. Their results found that religion is an important determinant of international-policy preferences. For example, pre-Vatican II Catholics and fundamentalist Protestants tend to prefer policies that restrict imports and immigration. Again using data from the General Social Survey and the U.S. Census, Gruber (2005) investigates religious market structure by estimating the effects of religious participation on economic measures of well-being. He found that religious market density[42]leads to a significantly increased level of religious participation, higher levels of education and income, lower levels of welfare receipt and disability, higher levels of marriage, and lower levels of divorce.

More recently, Gruber and Hungerman (2006) used data from the General Social Survey (GSS) on religious attendance to investigate the relationships between religious attendance and blue laws and data from the Consumer Expenditure Survey (CEX) to to investigate the relationships between religious contributions and blue laws. They found that secular competition does matter for religious participation as increased opportunities for work and leisure on Sundays led to less time at church and lower religious contributions. Using data from the Indonesia's The Hundred Villages Survey, Chen (2008) finds increased Koran study and increase Islamic school attendance was spurred by the Indonesian economic crisis of 1997-1998 with less of a consumption drop by those who became more religious. Chen further finds that shifting macroeconomic conditions can effect religious participation, though his findings do not cover an entire business cycle. Using data from the International Social Survey Program, Froese and Bader (2008) examined how images of God, as measured by God's perceived level of engagement and

[42] The share of the population in an area which is of an individual's religion.

authority, relate to political ideology in Australia, France, Hungary, Ireland, Latvia, New Zealand, the Slovak Republic, and the United States. Based on their findings, they argue that theological beliefs tend to be unrelated to general measures of political ideology, because religious perspectives are rarely fully liberal or conservative in their political orientation. Using data from the General Social Survey, Granger and Price (2009) examined the likely effectiveness of public health interventions by Faith-based Organizations (FBOs) designed to change the risky sexual behavior associated with HIV/AIDS. Their results suggested that, at least in the case of heterosexuals, FBOs can influence the risky sexual behavior that is associated with the transmission of HIV/AIDS. Researching economic attitudes, financial decision making and religious background on the micro-level, Renneboog and Spaenjers (2009) used DNB Household Survey data to investigate whether religious denomination affects household finance in the Netherlands. Based on the survey results, they argue that religious households care more about saving, are more risk-averse, consider themselves more trusting, have a more external locus of control, and have a stronger bequest motive. They also found that Catholics and Protestants have longer planning horizons, while Protestants and Evangelicals seem to have a greater sense of individual financial responsibility.

Riegle-Crumb and Callahan (2009) utilized data from the Adolescent Health and Academic Achievement Study (AHAA), and the National Longitudinal Study of Adolescent Health (Add Health) to examine how the racial/ethnic and generational status composition of Latino students' friendship groups is related to their academic achievement and whether there are differential effects by gender. Using multivariate regression analyses they found that for Latina girls, there are positive effects of having

more friendship ties to third-plus-generation Latino peers in contrast to dominant culture peers. Latino boys benefit academically from ties to all co-ethnic peers. Having friends with higher parental education promotes achievement of both genders. Lambert et al. (2010) used multivariate regression equations to determine the association of personal characteristics, distributive justice, and procedural justice with the life satisfaction, burnout, and turnover intent of correctional employees. The data was based on a survey of 160 staff at a private midwestern maximum-security institution. They found that distributive and procedural justice had a statistically significant inverse association with burnout and turnover intent, while procedural justice had a significant positive relationship with life satisfaction. Asking how are libraries used as meeting places, and by whom, Aabo, Audunson and Varheim (2010) used survey data identified six categories of places: the library as a "square," as a place for meeting diverse people, as a public sphere, as a place for joint activities with friends and colleagues, as a metameeting place, and as a place for virtual meetings. From a population in three townships in Oslo, multivariate regression analyses were performed. Utilizing data from the 2002 Kaiser/Pew Latino National Survey of Latinos, Lavariega Monforti and Sanchez (2010) investigated the presence of perceptions of internal discrimination among Latinos. Using descriptive statistics and multivariate regression analysis they that 84% of Latinos in the survey sample believe that Latino internal discrimination is problematic. They also found support for their theory that perceptions of internal discrimination are greater for those who are less integrated into U.S. society, as well as for Latinos who self-identify as black.

Data

The data for this research is built upon a large study of the SDA church, *AVANCE: A Vision for a New Mañana* by Ramírez-Johnson and Hernández (2003). Conducted as follow-up to the Valuegenesis study (Dudley and Gillespie 1992; Rice and Gillespie 1992), *AVANCE* focused on the SDA Hispanic Community in North America. *AVANCE's* investigated what variables affect the relationship between Adventist homes, schools, and churches and Hispanic youth and adult's commitment to the Christian faith. This relationship was examined within the context of acculturation, socioeconomic levels, and other variables affecting Hispanics in the United States.

The *AVANCE* research team, the Valuegenesis research team, and the Search Institute of Minneapolis, Minnesota (Dudley and Gillespie 1992) developed the questions and scales used in the *AVANCE* study questionnaire. A common core of questions with a separate section each for adults and youth[43] made up each bilingual[44] questionnaire. The study was also replicated in Puerto Rico, with 658 individuals participating. The same questionnaire developed in the North American study was used with an errata sheet specifically for Puerto Rico. The questionnaires were administered in 1994.

Since the researchers wished to reach the SDA adult and youth population, as well as family units, the questionnaire was administered within the church setting as part of a church worship service or immediately after a church service[45]. A survey coordinator administered the questionnaire. When possible, a member of the *AVANCE* team participated as survey coordinator. All participants received the same instructions.

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[43] Adults = 26+, Youths = 25 or younger.
[44] As would be expected, Spanish and English.
[45] The bias of the sample is towards those who are more likely to attend church.

Husbands, wives, and youths were separated and could take as much time as needed. Most questions were answerable in a Likert scale options ranging from strongly agree to strongly disagree and all respondents were ensured complete anonymity. *AVANCE's* primary funding source was a grant from the North American Division of the Seventh-day Adventist Church.

The church sample was selected as follows: Researchers randomly selected the churches from the total population of churches and stratified them by size from the list of churches in the West Puerto Rico Conference of Seventh-day Adventists in 1994. The selection was stratified by church size to ensure that small churches had the same likelihood of being selected as large churches. All churches selected in the sample participated.

Beyond the book that resulted from the *AVANCE* study in Puerto Rico, there have been two other academic works that utilized *AVANCE's* Puerto Rico data. Concentrating on high-school students enrolled in Seventh-day Adventist academies and youth (ages 13-25) who attended SDA churches in Puerto Rico, Jiménez (2009) studied how influential parents are in fostering spiritual growth in their children. He found that parents have a strong influence on their children's devotional and church attendance practices. Rivera (2005) studied risk factors associated with attempted suicide among Puerto Rican Seventh-day Adventists. He studied family-related factors, abuse history, religiosity, sexuality, gender, substance abuse, age and socioeconomic status and found that Puerto Rican SDA adolescents and young adults have suicide attempt rates similar to the general population. Seven variables were significantly related to suicide attempt:

family cohesion, parental understanding, parental knowledge of youth activities, verbal abuse, sexual abuse, physical abuse and substance abuse.

The 30 to 90-minute survey included 302 questions,[46] and the results showed promise as a tool to evaluate economic development among the members of the SDA church in Western Puerto Rico. These types of questions help evaluate how members of the SDA church identify economic benefits from converting to Seventh-day Adventism. It is worth taking a closer and more detailed investigation at SDA membership and its influence on the economic development of its members in Puerto Rico. Since purpose of this research is to investigate what perceived influence the SDA church has had on the development of those members in the island where the SDA church has been active, the three variables outlined by the HDI will provide the variables to be measured.

Standard of living questions will be used to create standard a "Standard of Living Index," with dietary and lifestyle choices as a proxy for life expectancy. This "Health Index" will include questions on vegetarianism, alcohol consumption, tobacco use, etc. For the education variable, we will measure the question pertaining to further education. Research Question: Do Seventh-day Adventists in Puerto Rico perceive economic development benefits to their conversion?

Hypotheses

- Seventh-day Adventists in Puerto Rico believe that conversion to the Seventh-day Adventist church has improved their economic development by encouraging more healthful practices.

[46] See Appendix A for a full list of *AVANCE's* questions.

- Seventh-day Adventists in Puerto Rico believe that conversion to the Seventh-day Adventist church has improved their economic development by encouraging further education.
- Seventh-day Adventists in Puerto Rico believe that conversion to the Seventh-day Adventist church has improved their economic development by increasing their standard of living.

Independent Variables

The following descriptive statistics, demographic characteristics and the "Commitment Index" will serve as the independent variables, with scaling similar to the AVANCE study:

1. Gender - Q13: Are you male or female? This variable will employ a dummy variable with a binary 1-0 outcome.
2. Education Level - Q16a (You): Indicate the highest level of education completed by each person.
3. Age - Q77*: How old are you?
4. Income - Q99: About how much money did your family or household earn last year?
5. Previous Religious Affiliation - Q181*: Before becoming an Adventist, with what denomination were you affiliated? In the survey, the results to this question can be seen in Table 6 below.

Table 6

Previous Religious Affiliation of AVANCE Study Participants

Previous Religious Affiliation	Amount	Percent
Always Adventist	163	25.35%
Roman Catholic	277	43.08%
Baptist	6	0.93%
Pentecostal/AoG/CoG	26	4.04%
Presbyterian	22	3.42%
Methodist	9	1.40%
Jehovah's Witness	4	0.62%
No other church	119	18.51%
Other	17	2.64%
	643	100.00%

This analysis will combine some of the above categories into four categories:

- Always Adventist
- Roman Catholic
- Other Protestant (Baptist, Pentecostal/AoG/CoG, Presbyterian, Methodist)
- No other church

Because their doctrines are viewed as heterodox to Protestant Christianity (Martin 1997), thus not particularly compatible in comparison, "Jehovah's Witness" will be removed. Those responding "Other" will also be removed due to the difficulty in conjecturing what that may mean. This variable will employ a dummy variable with a binary 1-0 outcome.

6. "Commitment Index," which is similar to the process of religious self-categorization used by Fox and Tabory (2008) aims to measure the level of commitment to the SDA church. For this variable, three church affiliation/attachment questions will be averaged. The closer the average is to 5, the higher presumed commitment to the SDA church.

- Q65: I am proud of being a 7th Day Adventist.
- Q279: How do you rate your present relationship to the church?
- Q291: I could not see myself leaving the SDA church.

Dependent Variables

Religious beliefs and religious service attendance are both recognized measures of religiosity (Andersen and Taylor 2007). Nevertheless, questions that may hold a doctrinal component will not be used to avoid potential circularity problems among the independent and dependent variables. The dependent variables will focus on how Adventism has affected member's life through questions that parallel the variables outlined by the HDI. Along with paralleling the HDI, these indices and questions echo Stark and Glock's (1968) five dimensions[47] of religious commitment by focusing on the "consequential dimension" of Seventh-day Adventism. This dimension includes the effects that religion has in a member's life.

Based on a categorization of the survey questions, four indices were constructed. The aforementioned commitment index serves as both independent and dependent variable. The following three indices will serve as the dependent variables, with scaling similar to the AVANCE study:

"Health Index" – based on questions regarding various tenets of the SDA health message, aims to measure adherence to those parts of the SDA orthodoxy that suggests a longer life expectancy (Fraser 2003; Montgomery et al. 2007). For this variable, the

[47] Stark and Glock's (1968) five dimensions are the (1) belief dimension, (2) religious practice dimension, (3) the experience dimension, (4) the knowledge dimension and the (5) consequential dimension.

following six questions will be averaged. The closer the average is to 5, the higher presumed adherence to the SDA health message.

> As an Adventist, how much do you agree or disagree with the following practices?
>
> - Q126: One should not use tobacco.
> - Q127: One should not drink beer or liquor.
> - Q134: One should not eat "unclean" meats.
> - Q135: One should be a vegetarian.
> - Q139: One should exercise daily.
> - Q142: One should not use drinks that contain caffeine.

"Standard of Living Index" – based on questions concerning employment and personal finances, aims to measure whether or not SDAs in Puerto Rico believe that conversion to Adventism has been financially beneficial. For this variable, the following questions will be averaged. The closer the average is to 5, the higher the perceived economic benefits from being an SDA.

1. Q296*: Since you conversion to Adventism, are you likely to be economically better or worse off?
2. Q300*: My money doesn't seem to go far enough since becoming Adventist.
3. Q301*: I have a better job now that I am an Adventist.

"Education Index" Q299*: I have been motivated to further my education since becoming an Adventist.

* = Modified from the original scaling in the AVANCE study

"Development Index," based on the Health Index, Standard of Living Index and Education question, serves as a meta-index.

Table 7

Variables with Scaling

Measure	Description
Independent Variables	
Gender	1= Male 0= Female
Education Level	1= No formal school 2= Grade school 3= High school 4= Some college 5= College graduate 6= Master's degree 7= Postgraduate
Age	1= 18-25 2= 26-33 3= 34-41 4= 42-49 5= 50-57 6= 58-65 7= 66+
Income	1= < than $5,000 2= $5,000 - $9,999 3= $10,000 - $14,999 4= $15,000 - $24,999 5= $25,000 – $34,999 6= $35,000 - $49,999 7= $50,000 - $74,999 8= $75,000 +

Table 7 (Continued).

Measure	Description
Previous Religions Affiliation	
Always Adventist	1= Always Adventist 0= Not always Adventist
Previously Catholic	1= Previously Catholic 0= Not previously Catholic
Non-SDA Protestant	1= Previously Non-SDA Protestant 0= Not previously Non-SDA Protestant
No other church	1= Previously no other church 0= Not previously no other church
Independent & Dependent Variable	
Commitment Index	
Proud of Being an SDA	1= Strongly disagree 2= Disagree 3= I'm not sure 4= Agree 5= Strongly agree
Relationship with Church	1= Very weak 2= Lukewarm 3= Average 4= Relatively strong 5= Very strong
I could not see myself leaving the SDA church	1= Strongly disagree 2= Disagree 3= I'm not sure 4= Agree 5= Strongly agree

Table 7 (Continued).

Measure	Description
Dependent Variables	
Health Index	
One should not use tobacco	1= Not at all strictly
One should not drink beer or liquor	2= Somewhat strictly
One should not eat "unclean" meats	3= I'm not sure
One should be a vegetarian	4= Quite strictly
One should exercise daily	5= Very strictly
One should not use drinks that contain caffeine	
Standard of Living Index	
Since conversion to SDA, are you better off?	1= Much worse 2= Little worse 3= Same 4= Little better 5= Much better
Money does not goes as far since becoming SDA	1= Strongly agree 2= Agree 3= Not sure 4= Disagree 5= Strongly disagree
Better job since becoming SDA	1= Strongly disagree 2= Disagree 3= Not sure 4= Agree 5= Strongly agree
Education	
Motivated to further my education since SDA	1= Strongly disagree 2= Disagree 3= Not sure 4= Agree 5= Strongly agree
Development Index	
A summary of Health Index, Standard of Living Index and Education - the closer to five, the higher the perceived economic development benefits of Adventism	

Demographic and Descriptive Statistics

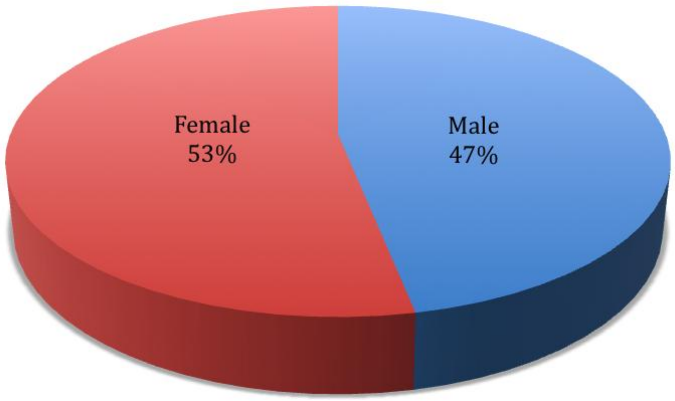

Figure 26. Gender.

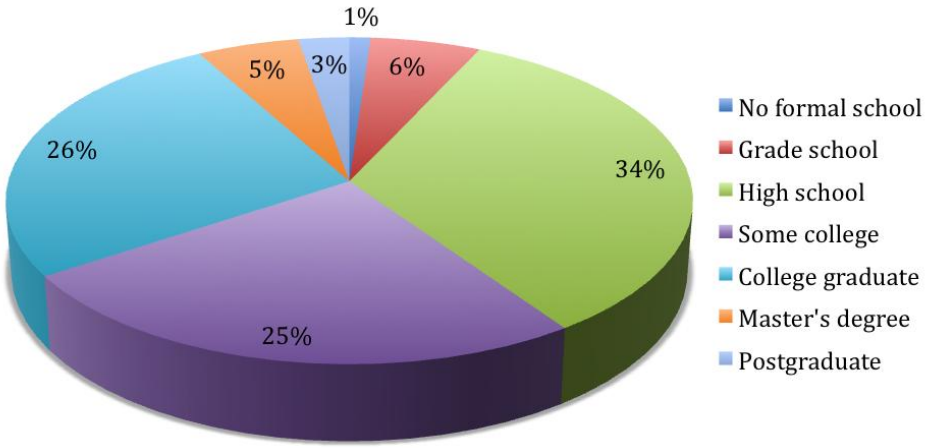

Figure 27. Educational Attainment.

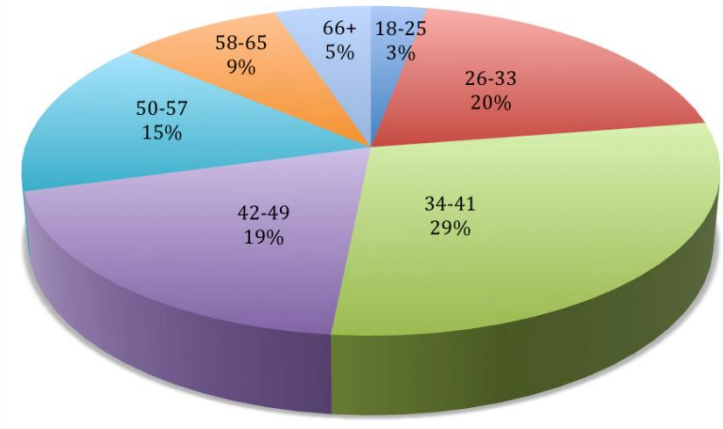

Figure 28. Age.

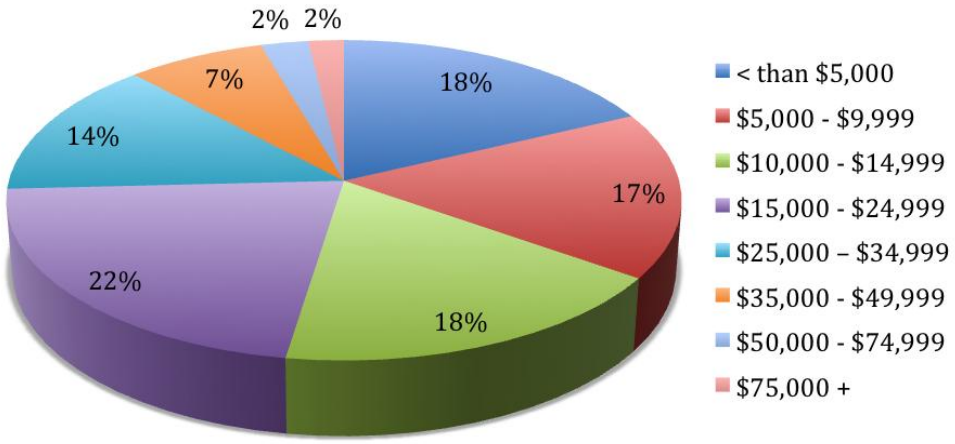

Figure 29. Income Level.

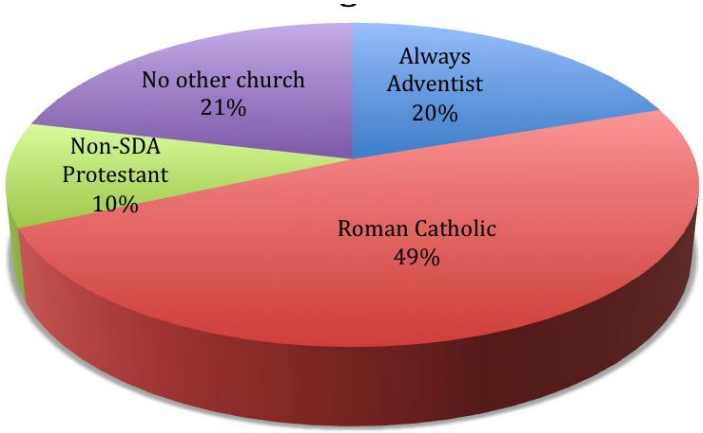

Figure 30. Previous Religious Affiliation.

Regression Models

Simple and multivariate regression models estimated the association between demographic, socio-economic and religious variables and perceptions of economic development. Simple regression analysis was used to determine which independent variables had a statistically significant influence on the dependent variables. These models were then used to determine which independent variables would be utilized in the multivariate regression analysis.

Running an ordinary least squares regression using STATA 11.1 Data Analysis and Statistical Software, this chapter employed three statistical tests to determine the relationships between the dependent and independent variables. The three tests are as follows:

1. R^2, also called the coefficient of determination, is the proportion of variation in the dependent variable about its mean explained by the independent variable(s) in the model. The closer R^2 is to 1, the better job the model does in explaining the variation in the dependent variable and the greater the model's predictive ability.
2. T-stat is a test to determine a regression model's usability. It measures how strongly the independent variable explains variations in the dependent variable. If the slope is significantly different than zero, then we can use the model to help predict the dependent variable for any value of the independent variable. It confirms that the independent variable belongs in the model; the larger the t-stat the better the independent variable's explanatory power. If you regression is based on a large sample (typically 30+ observations), a t-stat greater than 2 (or less than -2) indicates the coefficient is significant with >95% confidence. A t-stat greater than 1.68 (or less than -1.68) indicates the coefficient is significant with >90% confidence.
3. The P value is used to determine if the independent variables reliably predicts the dependent variable by measuring the probability that the independent variable has nothing to do with the dependent variable. As compared to the alpha (0.05 for the purposes of this chapter, which is typical), if the p value is smaller then it can be concluded that the independent variable reliably predicts the dependent variable.

Low p value improves fit of the model while greater than 0.05 means that the coefficient may be only "accidently" significant. If the P value is higher than .05, a strong argument can be made for eliminating this particular independent variable from a model because it isn't statistically significant. The P value says nothing about the size of the effect that the independent variable is having on your dependent variable. It is possible to have a highly significant result for a small effect.

Analysis

Regression Results Outline[48]

Table 8

Standard of Living Index as Dependent Variable

Independent Variables	R^2	t-stat	p-value
Gender	0.0005	0.48	0.634
Education Level	0.0079	1.87	0.063
Age	0.0157	2.63	0.000
Income	0.0302	3.81	0.000
Always SDA	0.0000	-0.09	0.925
Previously Catholic	0.0006	0.55	0.584
Previously other Protestant	0.0002	-0.34	0.733
Previously no other religion	0.0002	-0.30	0.765
Commitment Index	0.0615	6.31	0.000

[48] See Appendix B for detailed results of all regression models.

The results of the R^2 can be interpreted as follows:

- Of the variance in Standard of Living Index, 0.05% can be predicted from Gender.
- Of the variance in Standard of Living Index, 0.79% can be predicted from Education Level.
- Of the variance in Standard of Living Index, 1.57% can be predicted from Age.
- Of the variance in Standard of Living Index, 3.02% can be predicted from Income.
- Of the variance in Standard of Living Index, 0.00% can be predicted from Always SDA.
- Of the variance in Standard of Living Index, 0.06% can be predicted from Previously Catholic.
- Of the variance in Standard of Living Index, 0.02% can be predicted from Previously other Protestant.
- Of the variance in Standard of Living Index, 0.02% can be predicted from Previously no other religion.
- Of the variance in Standard of Living Index, 6.15% can be predicted from Commitment Index.

Table 9

Standard of Living Index as Dependent Variable Interpretation

Independent Variable	T-stat interpretation	P-value interpretation
Gender	Does not belong in model	Does not belong in model
Education Level	Does not belong in model	Does not belong in model
Age	Belongs in model	Belongs in model
Income	Belongs in model	Belongs in model

Table 9 (Continued).

Independent Variable	T-stat interpretation	P-value interpretation
Always SDA	Does not belong in model	Does not belong in model
Previously Catholic	Does not belong in model	Does not belong in model
Previously other Protestant	Does not belong in model	Does not belong in model
Previously no other religion	Does not belong in model	Does not belong in model
Commitment Index	Belongs in model	Belongs in model

Table 10

Health Index as Dependent Variable

Independent Variable	R^2	t-stat	p-value
Gender	0.0000	-0.02	0.987
Education Level	0.0060	1.71	0.089
Age	0.0012	0.70	0.486
Income	0.0014	0.78	0.436
Always SDA	0.0080	0.63	0.527
Previously Catholic	0.0004	0.44	0.658
Previously other Protestant	0.0004	0.48	0.628
Previously no other religion	0.0044	-1.38	0.169
Commitment Index	0.0850	6.29	0.000

The results of the R^2 can be interpreted as follows:

- Of the variance in Health Index, 0.00% can be predicted from Gender.
- Of the variance in Health Index, 0.60% can be predicted from Education Level.

- Of the variance in Health Index, 0.12% can be predicted from Age.
- Of the variance in Health Index, 0.14% can be predicted from Income.
- Of the variance in Health Index, 0.80% can be predicted from Always SDA.
- Of the variance in Health Index, 0.04% can be predicted from Previously Catholic.
- Of the variance in Health Index, 0.04% can be predicted from Previously other Protestant.
- Of the variance in Health Index, 0.44% can be predicted from Previously no other religion.
- Of the variance in Health Index, 8.50% can be predicted from Commitment Index.

Table 11

Health Index as Dependent Variable Interpretation

Independent Variable	T-stat interpretation	P-value interpretation
Gender	Does not belong in model	Does not belong in model
Education Level	Does not belong in model	Does not belong in model
Age	Does not belong in model	Does not belong in model
Income	Does not belong in model	Does not belong in model
Always SDA	Does not belong in model	Does not belong in model
Previously Catholic	Does not belong in model	Does not belong in model
Previously other Protestant	Does not belong in model	Does not belong in model
Previously no other religion	Does not belong in model	Does not belong in model
Commitment Index	Belongs in model	Belongs in model

Table 12

Education Index as Dependent Variable

Independent Variable	R^2	t-stat	p-value
Gender	0.0003	0.38	0.701
Education Level	0.0040	1.14	0.255
Age	0.0000	-0.02	0.987
Income	0.0014	-0.76	0.446
Always SDA	0.0033	1.47	0.142
Previously Catholic	0.0042	-1.40	0.163
Previously other Protestant	0.0004	0.50	0.615
Previously no other religion	0.0002	0.33	0.742
Commitment Index	0.1527	7.72	0.000

The results of the R^2 can be interpreted as follows:

- Of the variance in Education Index, 0.03% can be predicted from Gender.
- Of the variance in Education Index, 0.40% can be predicted from Education Level.
- Of the variance in Education Index, 0.00% can be predicted from Age.
- Of the variance in Education Index, 0.14% can be predicted from Income.
- Of the variance in Education Index, 0.33% can be predicted from Always SDA.
- Of the variance in Education Index, 0.42% can be predicted from Previously Catholic.
- Of the variance in Education Index, 0.04% can be predicted from Previously other Protestant.

- Of the variance in Education Index, 0.02% can be predicted from Previously no other religion.
- Of the variance in Education Index, 15.27% can be predicted from Commitment Index.

Table 13

Education Index as Dependent Variable Interpretation

Independent Variable	T-stat interpretation	P-value interpretation
Gender	Does not belong in model	Does not belong in model
Education Level	Does not belong in model	Does not belong in model
Age	Does not belong in model	Does not belong in model
Income	Does not belong in model	Does not belong in model
Always SDA	Does not belong in model	Does not belong in model
Previously Catholic	Does not belong in model	Does not belong in model
Previously other Protestant	Does not belong in model	Does not belong in model
Previously no other religion	Does not belong in model	Does not belong in model
Commitment Index	Belongs in model	Belongs in model

Table 14

Commitment Index as Dependent Variable

Independent Variable	R^2	t-stat	p-value
Gender	0.0043	1.46	0.146
Education Level	0.0067	1.81	0.070
Age	0.0058	1.60	0.111

Table 14 (Continued).

Independent Variable	R^2	t-stat	p-value
Income	0.0010	0.60	0.550
Always SDA	0.0004	0.43	0.667
Previously Catholic	0.0000	0.16	0.876
Previously other Protestant	0.0008	0.63	0.531
Previously no other religion	0.0024	-1.04	0.298

The results of the R^2 can be interpreted as follows:

- Of the variance in Commitment Index, 0.43% can be predicted from Gender.
- Of the variance in Commitment Index, 0.67% can be predicted from Education Level.
- Of the variance in Commitment Index, 0.58% can be predicted from Age.
- Of the variance in Commitment Index, 0.10% can be predicted from Income.
- Of the variance in Commitment Index, 0.04% can be predicted from Always SDA.
- Of the variance in Commitment Index, 0.00% can be predicted from Previously Catholic.
- Of the variance in Commitment Index, 0.08% can be predicted from Previously other Protestant.
- Of the variance in Commitment Index, 0.24% can be predicted from Previously no other religion.

Table 15

Commitment Index as Dependent Variable Interpretation

Independent Variable	T-stat interpretation	P-value interpretation
Gender	Does not belong in model	Does not belong in model
Education Level	Does not belong in model	Does not belong in model
Age	Does not belong in model	Does not belong in model
Income	Does not belong in model	Does not belong in model
Always SDA	Does not belong in model	Does not belong in model
Previously Catholic	Does not belong in model	Does not belong in model
Previously other Protestant	Does not belong in model	Does not belong in model
Previously no other religion	Does not belong in model	Does not belong in model

Table 16

Development Index as Dependent Variable

Independent Variable(s)	R^2	t-stat	p-value
Gender	0.0003	0.40	0.688
Education Level	0.0101	2.13	0.034
Age	0.0056	1.55	0.121
Income	0.0059	1.63	0.103
Always SDA	0.0004	0.44	0.662
Previously Catholic	0.0000	-0.14	0.891
Previously other Protestant	0.0002	0.34	0.736
Previously no other religion	0.0005	-0.45	0.651
Commitment Index	0.1999	11.52	0.000

The results of the R^2 can be interpreted as follows:

- Of the variance in Development Index, 0.03% can be predicted from Gender.
- Of the variance in Development Index, 1.01% can be predicted from Education Level.
- Of the variance in Development Index, 0.56% can be predicted from Age.
- Of the variance in Development Index, 0.59% can be predicted from Income.
- Of the variance in Development Index, 0.04% can be predicted from Always SDA.
- Of the variance in Development Index, 0.00% can be predicted from Previously Catholic.
- Of the variance in Development Index, 0.02% can be predicted from Previously other Protestant.
- Of the variance in Development Index, 0.05% can be predicted from Previously no other religion.
- Of the variance in Development Index, 19.99% can be predicted from Commitment Index.

Table 17

Development Index as Dependent Variable Interpretation

Independent Variable	T-stat interpretation	P-value interpretation
Gender	Does not belong in model	Does not belong in model
Education Level	Belongs in model	Belongs in model
Age	Does not belong in model	Does not belong in model
Income	Does not belong in model	Does not belong in model

Table 17 (continued).

Independent Variable	T-stat interpretation	P-value interpretation
Always SDA	Does not belong in model	Does not belong in model
Previously Catholic	Does not belong in model	Does not belong in model
Previously other Protestant	Does not belong in model	Does not belong in model
Previously no other religion	Does not belong in model	Does not belong in model
Commitment Index	Belongs in model	Belongs in model

These findings can be more succinctly described. For the Standard of Living Index, Age, Income and Commitment Index have a statistically significant positive relationship. For the Development Index, Education Level and Commitment Index have a statistically significant positive relationship. For the Health Index and the Education Index only the Commitment Index has a statistically significant positive relationship. Finally, for the Commitment Index, none of the independent variables are statistically significant. Based on these results multivariate regression models were estimated (see tables 18, 19, 20 and 21).

Table 18

Multivariate Regression Model 1 Result

Dependent Variable	Independent Variable(s)	R^2	t-stat	p-value
Standard of Living Index	Age	0.1044	1.44	0.151
	Income		3.83	0.000
	Commitment Index		6.17	0.000

Of the variance in Standard of Living Index, 10.44% can be predicted from Age, Income and Commitment Index.

Table 19

Multivariate Regression Model 1 Interpretation

Independent Variable	T-stat interpretation	P-value interpretation
Age	Does not belong in model	Does not belong in model
Income	Belongs in model	Belongs in model
Commitment Index	Belongs in model	Belongs in model

Once Age became part of this multiple regression model it added little to the equation.

Table 20

Multiple Regression Model 2 Result

Dependent Variable	Independent Variable(s)	R^2	t-stat	p-value
Development Index	Education Level	0.2317	1.40	0.163
	Commitment Index		11.68	0.000

Of the variance in Development Index, 23.17% can be predicted from Education Level and Commitment Index.

Table 21

Multiple Regression Model 2 Interpretation

Independent Variable	T-stat interpretation	P-value interpretation
Education Level	Does not belong in model	Does not belong in model
Commitment Index	Belongs in model	Belongs in model

Once Education Level became part of this multiple regression model it added little to the equation.

The regression models suggest that of the variables measured, only commitment level has any significant affect on perceived economic development. Gender and previous religious affiliation have no effect, with education level, age and income level having minimal to negligible effect. These findings show that commitment level, or religiosity, and reported economic development are systematically related and are suggestive of a

casual relationship. This is not unexpected given the similar conclusions regarding the influence of religiosity on economic outcomes (White and Tiongco 1997; Garner 1998; Guisoa, Sapienza and Zingales 2003; Barro and McCleary 2003; McCleary and Barro 2006; Khan and Bashar 2008).

Conclusion

With sociologists arguing that it meets basic human needs (Henslin 2002), religion is a fundamental component of every culture. Anthropologists know of no people anywhere on the planet who, at any time, have been without some form of spirituality or religion (Haviland et al. 2008). Opitz (1994) writes that a science of the means, like economics (Von Mises 1996), needs a connection with a science of the ends, like religion, because a means by itself is meaningless; it is defined in terms of the end to which it is connected.

In both developed and emerging countries, the resilience of religion, with its universal influence on political will and popular debate, has been observed (Iannaccone 1998; Finke and Starke 2001; Glaeser 2005). This may help explain why economists have started to recognize that religion's role should be acknowledged to fully understand the workings of economic systems (Nelson 2001) and that it is an important determinant of a country's economic development. Barro and McCleary (2002) write that economic growth analysis must include social factors such as religion. This is almost certainly ideal, since appending economic attitudes and activities with beliefs, norms and values gives a more realistic picture of human behavior (Mangeloja 2003).

While there is no consensus on the exact causal relationship between religion and economic development, most empirical studies point to a positive relationship (Khan and

Bashar 2008). This can be because religions often promote honesty, hard work, education and other activities that often produce positive economic outcomes, meanwhile discouraging activities that often produce negative economic outcomes.

This chapter added to the understanding regarding the relationship between religion and economic development that has been a focus of research for decades and philosophy for centuries. This was done through an investigation of what perceived affects the Seventh-day Adventist church has had on the economic development of members on the island of Puerto Rico. Development was measured using the three variables outlined by the United Nation's Human Development Index.

The HDI has been designed to facilitate long-run comparisons and is a measure of the distance covered from minimum to maximum development in terms of three components: income, longevity, and education (Crafts 1999). This is based on the concept that human development is somewhat broader than economic development and should promote human fulfillment. The UN's Human Development Index seems to serve well as an approximation to collective human development in an economy (Sun 1997).

This chapter's conclusion is that commitment level, or religiosity, and economic development are systematically related and suggestive of a casual relationship. These results are not entirely unexpected since the "patterns and practices of religious institutions are among the most important influences on people's lives" (Andersen and Taylor 2007, 337). Nevertheless, there are some additional research opportunities that could add to the conversation regarding the intersections of religion and economic development. A follow-up investigation may include investigating if members are more committed because they are doing better economically or are they doing better

economically because they are committed. Another approach might include expanding the survey to a wider membership sample. The methodology was biased towards those that attend meetings above and beyond the traditional weekly gathering, a priori suggesting a higher commitment level. Presumably, this higher level brings with it increased educational opportunities, a more holistic health approach, social capital and other benefits often attendant of religiosity. Along with providing answers to questions of ultimate meaning, religion establishes values, moral proscriptions and behavioral norms (Furseth and Repstad 2006; Andersen and Taylor 2007). Through these norms and values, religion influences behavior (Bock, Cochran and Beeghley 1987) with conservative denominations, like the SDA church, producing particularly strong behavioral influences (Gay and Ellison 1993; Wellman 1999).

CHAPTER IV

FAITH AND FIGURES IN *LA ISLA DEL ENCANTO*– THE EFFECTS OF THE PUERTO RICAN ECONOMY ON SEVENTH-DAY ADVENTIST CHURCH GROWTH AND GIVING

"Economics and religion have generally been as separate as chalk and cheese."

Weber and Coy 2004

This chapter completed the research on religion and economic development by combining the elements elucidated in the previous two chapters. Using macroeconomic data from Puerto Rico and growth and giving metrics from the Seventh-day Adventist Churches in Puerto Rico added to the conversation on the potential links between religion and economic development. How the Puerto Rican economy influences Seventh-day Adventist membership growth and giving in Puerto Rico was examined with Azzi and Ehrenberg (1975) serving as the theoretical perspective.

The Seventh-day Adventist (SDA) church, founded, organized and headquartered in the United States of America, has a worldwide network of churches, schools, colleges, hospitals, clinics, media centers and development offices. This global reach presented an attractive research opportunity. Doctrines that may influence economic development along with organizations that promote educational attainment added to the appeal.

Puerto Rico invites investigation from United States economists (Baumol and Wolff 1996) and is a case of legitimate interest to development scholarship (Padin 2003). With one of the most dynamic economies in the Caribbean region (Vega-Rosado 2006), Puerto Rico represents one of the earliest examples of development through integration to the world economy, thus should be of special interest (Sotomayor 2004).

The rest of this chapter will be organized as follows: An introduction to Azzi and Ehrenberg (1975), threat and authoritarianism and the literature on religion and economics will be followed by an overview of Puerto Rican history and economics and Seventh-day Adventist Church history. Methods and data will then be introduced and immediately followed by data analysis. The chapter will conclude with some possible implications and suggestions for additional research.

Literature Review

The A-E Model

It was Azzi and Ehrenberg (1975) who developed the first economic model of religiosity investigating the links between changing macroeconomic conditions and religious participation by focusing on church membership and the frequency of church attendance. Their model attempted to explain household allocation of time given to religious activities, while taking religious beliefs as predetermined. It was the first systematic attempt to study participation in religious activities through the rational-choice approach to the demand for religion. It was the starting point for the most recent literature on the economic analysis of religion and pioneered the modern economics of religion (Iannaccone 1998; Ekelund, Hebert and Tollison 2002; Pita Barros and Garoupa 2002; McCleary and Barro 2006).

The A-E model (Iannaccone 1998) analyzed how time was spent in religious activity, with a hypothesis that individuals invest time in religious activities to maximize satisfaction from consumption of all commodities, including salvation after death (Redman 1980). Thus, they primarily concerned the research with the "salvation motive," where expected afterlife consumption relates to an individual's participation in

church-related activities. That religious participation and religious giving are substitutes in the production of afterlife consumption is one of this model's key assumptions, thus implying that changing opportunity costs of religious participation over the business cycle are offset by changes in religious giving (Beckworth 2009).

Iannaccone (1998) wrote that psychology's, anthropology's, and sociology's accepted paradigms of religion has categorized religion as an irrational calculus, thus aiding in the slow start of the economics of religion. Since its writing, many economists and social scientists have utilized Azzi and Ehrenberg's model including most recently Brazas-Garza and Neuman (2004), North and Gwin (2004), Fase (2005), McCleary and Barro (2006), Chang (2006), Graafland and Mazereeuw-Van Der Duijn Schouten (2007), Jose and Alfons (2007), James (2008), Cotter and Song (2009), Brazas-Garza, Rossi and Zaclicever (2009), and Becsi (2010).

Threat and Authoritarianism

The hypothesis that threat is one cause of increased authoritarianism is an academic attraction for choosing to investigate the Seventh-day Adventist Church. There is a general acceptance of the link between social, political or economic threat and authoritarianism (Sales 1973; Altemeyer 1988; McCann and Stewin 1990; Simonton 1990; Doty et al. 1991; Peterson et al. 1993; Stone and Smith 1993). Threatening circumstances lead to higher levels of attraction to authoritarianism (Fromm 1941; Rokeach 1960; Sanford 1966; Wilkinson 1972), with relatively authoritarian organizations becoming increasingly attractive.

From this theoretical foundation, Sales (1972) investigated the rate of conversions to authoritarian churches and to non-authoritarian churches during economically threatening

years. While it is a common notion that there is a general trend toward religion in economically threatening times (McCann 1999; Vitello 2008; Anderson 2009; Ferguson 2009), Sales found that only churches with relatively authoritarian traits become more appealing during these times. Specifically, Sales' (1972) research related contemporaneous economic threat to authoritarian behaviors by finding that difficult economic conditions increase conversion rates to authoritarian churches, while better economic times increase conversion rates to non-authoritarian churches. In his work, Sales concentrated on eight Christian denominations, which he classified as authorization and non-authoritarian as outlined below:

Authoritarian

- Church of Jesus Christ of Latter-day Saints
- Roman Catholic Church
- Seventh-day Adventist Church
- Southern Baptist Convention

Non-authoritarian

- Congregational Christian Church
- Northern Baptist Convention
- Presbyterian Church in the United States of America
- Protestant Episcopal Church

Sales' classification of the SDA Church as authoritarian has support. Photiadis and Schweiker (1970) outlined some characteristics of authoritarian organizations that can be applied to the SDA church, including a strongly conservative theology, an ethnocentric outlook and the risk of somewhat stern sanctions for apostasy. Kelley (1972) placed a number of denominations along a strictness gradient with eight churches classified as authoritarian, including the Seventh-day Adventists.

The Seventh-day Adventist Church has been classified as a fundamentalist church (Theobald 1985), that asks from their members financial commitments and behavioral restrictions (Iannaccone 1994; Finke and Stark 2001) and is centralized, hierarchial (Lawson 1998) and ultraconservative (Pita-Barros and Garoupa 2002), all of which are considered hallmarks of authoritarian churches. Additionally, while Steensland et al. (2000) have observed how evangelical denominations have sought separation from the broader culture, Bull (1990) writes that the SDA church has maintained an ideological and social distance from other Protestants, including even other evangelicals. This anti-ecumenical approach can be viewed as ethnocentric.

Among the denominations outlined by Sales (1972), the Seventh-day Adventist and Latter-day Saints have comparable commitment expectations and hierarchal structures. They both have distinctive lifestyle doctrines, which include a call for members to tithe[49] to the church along with further contributions to other church activities. Additionally, there is an expectation that members observe a weekly day of worship and rest, or Sabbath, which for Adventists are Saturdays and typically Sundays for Mormons (Campbell and Monson 2007; GCSDA 2010).

With clear lines of authority and a centralized and hierarchial structure, both churches are organized similar to the Catholic Church; all three have a single recognized headquarters and leader. Where the SDA church differs significantly from the other two is in the prophetic status of its leader. The LDS president is the apex of the organization, considered a prophet and entitled to receive divine instruction pertaining to the entire church. As Pope, the Bishop of Rome is considered the *Summus Pontifex* (Supreme

[49] Literally 10% of income.

Pontiff) and Successor of Saint Peter, who can invoke the Catholic dogma of Papal infallibility (Campbell and Monson 2007; Holy See 2003). The president of the SDA church is afforded no such distinctions.

Building on the above-articulated categorizations, the denominations researched by Sales (1972) can be graphed as seen in Figure 31 along demand and hierarchy axes. The SDA and LDS churches are considered high in both demand and hierarchy, while most mainline Protestant denominations, low in both areas, would be positioned in the non-authoritarian quadrant. Thus studying the Seventh-day Adventist church focuses this research in the High-demand/High-hierarchy quadrant of authoritarian church classifications.

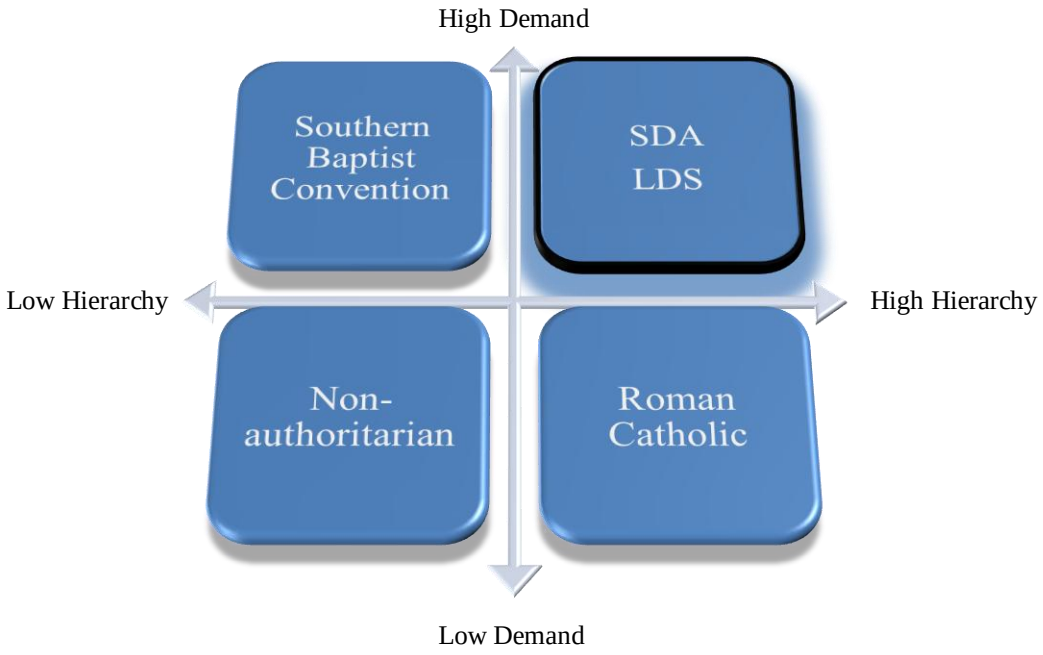

Figure 31. Authoritarian Denominational Classifications.

As this research moves forward, there is one caveat, excellently articulated by McCann (1999, 335) "Authoritarian and non-authoritarian are used as convenient

descriptive labels [since] … all churches may be said to be authoritarian at their core … This dichotomous categorization is meant to be entirely descriptive rather than evaluative and does not imply relative superiority of the churches in either category."

Religion and Economics[50]

With its themes of the universal common good and global civil society, Thomas Aquinas' *De Regno (De Regimine Principum) ad Regem Cypri* (1267) and *Summa Theologica* (1265–72), where Aquinas argued for the Christian commitment to progress (Stark 2005), were antecedents to the economic concern with religion and development. Adam Smith, in *Theory of Moral Sentiments* (1759), wrote that religious beliefs provide strong incentives for individuals to follow moral structures that often support economic growth. He wrote that our conscience is something innate and that people are born with a moral sense that is not provided by laws or by rationality. This same "invisible hand," Smith would argue, also creates beneficial social patterns out of our economic actions. Smith extended economic reasoning to an analysis of religious behavior in his *Wealth of Nations* (1776). Later, Max Weber's *Die protestantische Ethik und der Geist des Kapitalismus* (1904) theorized that religion may be a significant positive or negative force on economic development. Weber argued that the Protestant Reformation paved the way for modern capitalism by highlighting the value of individual responsibility, personal diligence, approved risk-taking and financial self-improvement. Heaven and salvation, hell and damnation and other supernatural rewards are great motivators of behavior in this world (McCleary and Barro 2006). Thus a key principle in the Weberian ethos is that religious beliefs, though not necessarily participation in organized religion,

[50] Or, chalk and cheese.

are critical for economic outcomes. Weber viewed religiosity as an independent variable capable of influencing economic results (McCleary 2007) by promoting work ethic, honesty, trust and thrift.

Current literature argues of religious beliefs and development being inextricably linked (White and Tiongco 1997). Swager (2000) writes that economic development must include a spiritual dimension (Figure 32), while Guiso, Sapienza and Zingales (2003, 1) found that "on average, religious beliefs are associated with 'good' economic attitudes, where 'good' is defined as conducive to higher per capita income and growth" and "that [overall] Christian religions are more positively associated with attitudes conducive to economic growth." This finding is similar to Barro and McCleary's (2003, 779), where they found "causal influences from religion to economic growth" and that "stronger religious beliefs stimulate growth because they help sustain specific individuals that enhance productivity." McCleary (2007) specifically argues that "religion contributes to economic growth." Most recently, Traunmuller (2009) found evidence of a double positive effect of Protestantism, where Protestants tend to be more trusting and that a Protestant context increases trust, regardless of individual religious belief.

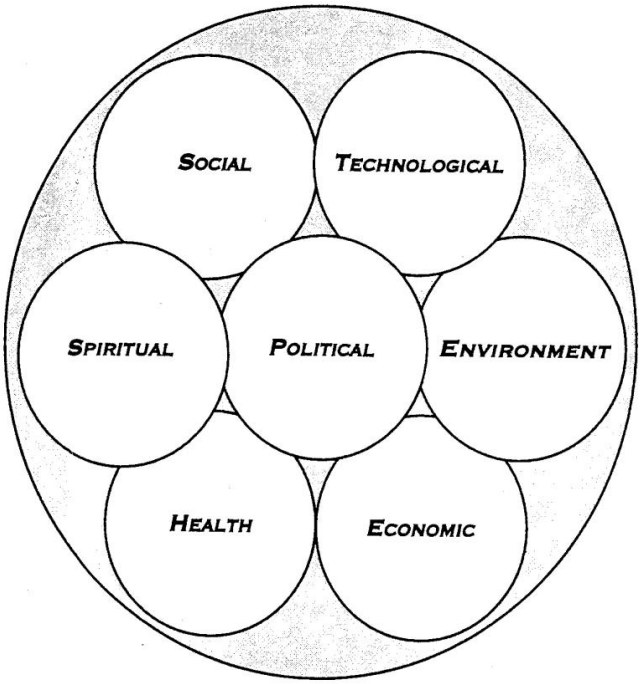

Figure 32. Dimensions of Economic Development (Swager 2000).

With the principal forms of Protestantism descending from his ideas, John Calvin was vital to the Protestant Reformation zeitgeist (Bellouc 1928; Tawney 1952; Hooker 1999). Historically positioned in the early stages of modern economic development, Calvin reflected on the Genesis account regarding human origins and noted that the Lord placed all of creation, including its wealth, in man's care, thus assigning human stewardship to economic matters. The Biblical archetype of *imago dei* (created in God's image) found in Genesis 1 suggests that man is capable of creating, allowing man to utilize God's abundance towards growing wealth. Along with this abundance came responsibility and a mandate for wise stewardship, which could help explain why for centuries after the Reformer's death wealth development occurred wherever Calvinists made their homes (Hall and Burton 2009). Calvinist thought also provided a theological basis for private property, largely missing in other cultures (Stark 2005) and the doctrines of thrift and hard work later influenced Adam Smith (Skousen 2006).

Calvin believed that economic success and religious faith evidenced that an individual had been chosen for salvation, as opposed to the medieval church's suspicion of the economic motive and condemnation of commerce. Attitudes toward commerce began to change as "Calvinism endowed the life of economic enterprise with a new sanctification" (Tawney 1952, 37), by accepting a commercial civilization and providing a creed to the business and merchant class (Nelson 2001). Protestant economic contributions, like the doctrine of man's duty to develop wealth, clergy support for capital markets, the belief that technological progress was a blessing, that long-term investments are not to be discouraged and thinking multigenerationally are often considered products of Calvinism (Belloc 1928; Stark 2005; Hall and Burton 2009). This stood in stark contrast to Luther's outlook on business enterprises as the "very essence to the kingdom of darkness" (Tawney 1952, 84), that saw no reason for the business classes in a Christian society.

A primary precept of Calvinism sought to inculcate religion into all areas of life and any area of work, including business, could be a calling from God; as valid and sacred as clergy. Calvinism taught that God values all work and is a part of His providential calling (Stark 2005; Hall and Burton 2009) thus liberating economic energy (Tawney 1952) and paving the way for modern, market-based business practices. With few theologians connecting economic philosophy with the divine quite this way, this new commercial tradition is among Calvinism's most enduring contributions (Bieler 1959; Hall and Burton 2009).

Despite these histories and the existing literature, economic development theory and practice has typically avoided engagement with religious discourse and often discounted

its role (Ver Beek 2000; Fox and Sandler 2005; Tomalin 2006; Sweetman 1999; Harper 2000; Selinger 2004). Wolfe (2006, 9) writes that, "For much of the postwar period, academic disciplines, including the social sciences, ignored religion, despite the fact that giants of social-scientific discovery such as Weber and Durkheim made the subject central to their understanding of the world … the role of religion in promoting Western capitalism has been underestimated."

Religion's role in the public discourse is increasingly recognized (Steensland et al 2000). Whether through symbols, pedagogy, rituals, preaching or discussion, religions shape member's concrete views on a wide range of social issues, including economic, (Wald, Owen and Hill 1988; Welch et al. 1993) in ways that often transcend social class, educational attainment, or other sociological factors (Leege and Kellstedt 1993; Davis and Robinson 1996; DiMaggio; Evans and Bryson 1996; Green, Guth and Smidt 1996; Wald and Calhoun-Brown 2007). There is sufficient rationale for development theorists and economists to accept religion's role on economic systems and its relevance on economic development (Nelson 2001; Barro and McCleary 2003; Mangeloja 2005; McCleary and Barro 2006).

Not everyone agrees with the positive link between religion and economic development. Fanfani (1935) argued that all religion has a negative effect on development with Beed and Beed (1996) echoing that secular economics seem to contradict several essential Christian beliefs. Wallerstein (1980, 1989) thinks the religion and economics relationship is likely to be one in which economics is the cause and religion the effect. With religion no longer fulfilling any important social function in

modern society (Harper 2000), Sanderson and Loucks assert (2004) that there is no reason to presume a causal connection between religion and economic development.

Puerto Rico

Cultural, historical and geographical factors make Puerto Rican an interesting case in regards to the intersections of religion and economics. The Roman Catholic faith was exported to Puerto Rico with the 16th century conquest and became a Roman Catholic colony. This experience produced cultural traditions penetrated by the Catholic faith. Thus religion, specifically Roman Catholicism, became the cultural support that came out of that historical background. Not unlike other countries founded by the Spanish empire, the religious values of the community are "deeply imbedded in the culture" and "it played a significant role in symbolizing the central values of the society" (Fitzpatrick 1987, 36). With their four hundred year shared history, language and religion, Spanish culture dominates Puerto Rican behavior (Spillan, Parnell and Singh 2007). Finally, as an island Puerto Rico possesses an isolation that provides a natural research laboratory.

Located at the eastern end of the Caribbean Sea, the island of Puerto Rico was discovered on November 19, 1493 during Christopher Columbus' second voyage. Ponce de León began the Spanish colony of the island in 1508 and thus it remained as a heavily fortified strategic location at the eastern end of the Spanish colonial empire until 1898 (Wagenheim 1975; Morales-Carrion 1984; Pico 2006).

Formally ceded by the Treaty of Paris after the Spanish-American war, Puerto Rico became an American possession on December 10, 1898. The 1917 Jones Act granted United States citizenship to Puerto Ricans and provided for the popular election to both houses of the legislature. However, appointing the governor remained the provenance of

the President of the United States. The U.S. Congress amended the act in 1947, granting Puerto Ricans the right to elect their own governor. Luis Muñoz Marín became Puerto Rico's first democratically elected governor, taking office in January 1949. Today, Puerto Rico's political status is called the Free Associated State of Puerto Rico. Fashioned under the leadership of Muñoz Marín, this provided for the increased autonomy of the island and established a relationship between Puerto Rico and the United States similar to commonwealth status (Maldonado-Denis 1972; Carr 1984; Fitzpatrick 1987).

Since 1917 Puerto Ricans have been American citizens, yet Puerto Rico remains significantly less prosperous than even the poorest U.S. state (Collins, Bosworth and Soto-Class 2006; Bram et al. 2008). Nevertheless, it has a per capita income substantially higher than the rest of Latin America and Puerto Rican quality-of-life measures such as literacy rates, years of schooling and life expectancy are closer to the most highly developed countries (Ladd and Rivera-Batiz 2006). Puerto Rico education levels exceed the most educated Latin American nations (Collins, Bosworth and Soto-Class 2006).

Transfer payments from the United States Federal Government are a large portion of Puerto Rican resident's income, providing approximately ¼ of Puerto Rican personal income (Burtless and Sotomayor 2006). While it is believed that many jobless Puerto Ricans work in the informal economy, a dubious accomplishment of the Puerto Rican economy is a significant employment shortfall, where the male participation was around 58% during the early 2000s. In 2000, the island had the lowest employment-to-population ratio in the Americas and Caribbean, with only 31% of the population

employed. In Puerto Rico, the government[51] is the island's largest employer and there is a private sector jobs shortfall, with only 28% of Puerto Rican adults working in the private sector (Enchautegui and Freeman 2006; Davis and Rivera-Batiz 2006; Burtless and Sotomayor 2006).

Though small, the Puerto Rican economy is one of the world's most open (Lawrence and Lara 2006), with free mobility of goods, services, capital and labor (Collins, Bosworth and Soto-Class 2006). Puerto Rico is one of the earliest examples of development through integration to the world economy (Rivera-Batiz and Santiago 1996) and circa 1950 it was as one of the world's fastest-growing economies, considered a model of modernization (Annals 1953; Baer 1959) often compared to the East Asian "Tigers." However, over the past several decades the economy has grown at a greatly reduced rate and since 1980 living standards have not converged with those of the United States (Bosworth and Collins 2006).

The Seventh-day Adventist Church

Between the 1790s and 1860, tens of thousands of Americans experienced religious conversion and joined evangelical churches. Probably more than any other revival, this Second Great Awakening left a lasting impression on the American social landscape, leaving behind established churches, democratization and social reform (McLoughlin 1978; Noll 1992). Social movements for temperance, abolition, feminism, peace, Utopian experiments, anti-Masonry and dietary reform flourished and new religious sects were founded (Brown 1952). Among those were Mormonism, Shakerism, Oneida Perfectionism and Seventh-day Adventism (Butler 1986).

[51] From the local level to the U.S. Federal Government.

A vital element of this 19th century revival was the idea of Millenarianism. Millenarianism was based on the 1,000 years of Revelation 20, and the Second Advent movement, which emphasizes the imminent return of Jesus Christ (Brown 1952; Neufeld 1976). Adding to the excitement was the calculation by William Miller, a farmer and Baptist layman from Low Hampton, New York, that the world would end in 1843 with Christ's return (Brown 1943).

Like many others, William Miller returned to belief in the Bible during the Second Great Awakening. What Miller added to the proceedings was a result of Bible study from 1816-1818, when he concluded "that in about twenty-five years from that time [1843] all the affairs of our present state would be wound up" and Jesus Christ would return[52] (Miller 1845).

Starting in the early 1830s, Miller spread the message by circuit riding through small New England towns with an illustrated series of lectures, which led to invitations to the larger cities. By 1840, he had triggered the most popular millenarian and Second Advent movement in American history (Butler 1986). Millerism and Adventism became household words in America (Knight 2004), aided by "an unprecedented media blitz" organized by Boston, Massachusetts Pastor Joshua V. Himes (Hatch 1989, 142). Natural phenomenon, like the Shower of Stars, the Great Comet, and the Dark Day were interpreted as ominous portents and increased the cacophony (Rowe 1985), while sermons, pamphlets, and books proclaimed that current events were a prologue to the millennium, with the prophetic periods of Daniel and Revelation coming to a close (Dederen 2000). Miller was not alone in his conclusions. Contemporary Bible scholars

[52] He reached this conclusion based on the prophetic time periods of Daniel and Revelation.

from around the globe wrote and spoke of the imminent Second Advent and concluded that the prophetic time periods were coming to an end; conclusions very similar to Miller's (Dederen 2000).

Though Miller initially rejected specifics regarding the exact time of the Second Advent, by January 1843 he hypothesized that Christ would return sometime between March 31, 1843 and March 31, 1844 (Knight 2004). Miller's year passed without Christ's return.

While the Millerites were disappointed, the movement continued, though with less enthusiasm. However, events in August 1844 breathed new life into the movement. At a camp meeting in Exeter, New Hampshire, Millerite minister S.S. Snow convincingly demonstrated that Christ would return on October 22, 1844. Realizing they had only about two months to warn the world of the imminent Second Advent and its attendant ruin and destruction, the Millerites mounted a final effort (Spalding 1961; Maxwell 1977; Knight 2004).

October 23, 1844 found the Millerites again disappointed with conflicting views and explanations regarding the recent events and the "truth" about the Second Advent competing for pre-eminence among the Millerites. This "seething cauldron and shapeless mass of discouragement and confusion" (Knight 2004, 26) were the origins of, among other sects, the Seventh-day Adventist Church (Sweet 1930; Butler 1986; Knight 2004), "the most significant institutional outgrowth of the Millerite movement" (Butler 1991, 4).

This Millerite progeny became an established denomination emphasizing sabbatarianism, eschatology, health reform, temperance, and religious liberty, while establishing a global network of medical institutions and an educational system

unparalleled in contemporary Protestantism (Butler 1991). This evolution from disenfranchised apocalyptic movement to established denomination was not guaranteed, if for no other reason that most early Adventists opposed church organization above the congregational level (Knight 2004). Many early Sabbath-keeping Adventists opposed denominational organization on theological grounds and for the personal reason that many had been cast out of their previous churches because of their Millerite beliefs and feared that church organization could become autocratic (Maxwell 1977).

In the early 1850s, continued growth of the movement produced concerns with the "gospel order" (church organization), as there was no system of clergy ordination, fund gathering and distributing and no legal organization for holding property. This last concern resulted from the expansion of publishing efforts. Publishing had become a significant enterprise, establishing the first Adventist institution, a publishing house in Battle Creek, Michigan. Concerns with ownership of the publishing properties pushed early Adventists toward a more formal and legal organizational structure. Church pioneers James and Ellen White founded the publishing house with the magazine *The Present Truth* (still in print today as the *Adventist Review*) in 1849 (Spalding 1961; Knight 2004). Since the group of believers had no legal organization, James White personally owned the press. It was suggested that the church should form an association that could be legally incorporated to own property; a common approach in contemporary American Christianity in organizing evangelistic and benevolent associations separately from denominations (Maxwell 1977).

A "general conference" was called by leading ministers for September 28 to October 1, 1860. Despite strong opposition, it was decided to incorporate the publishing house

and the name "Seventh-day Adventist" was adopted as best representing the beliefs of the nascent denomination – "observance of the Sabbath as holy and confidence in Jesus' imminent second advent" (Dederen 2000, 1). May 3, 1861 found the incorporation of the Seventh-day Adventist Publishing Association under the laws of the state of Michigan and in October the Michigan Conference of Seventh-day Adventists was formed (Knight 2004).

During May 1863, the final step in the development of church organization occurred at a Battle Creek meeting of church representatives (Knight 2004). On Thursday, May 21, 1963 formal organization was sanctioned (Maxwell 1977) and the General Conference of Seventh-day Adventists was formed with approximately 3,500 members and about 30 ministers (Knight 2004). The Adventists grew from a small group of about 100 in the aftermath of the "Great Disappointment," to 200 members in 1850, to a membership of 3,500 at their formal organization in 1863 (Gaustad 1976).

Another important point in SDA history came in 1863. After doctrinal and organizational concerns were sorted, lifestyle issues, particularly health reform, became the next step in Adventism's development[53] (Knight 2004). An impetus for this development was an epidemic of illness among church (Spalding 1962). The year 1866 saw the founding of the Western Health Reform Institute in Battle Creek, the first of what eventually would become a worldwide network of SDA health-care institutions. In 1876 John Harvey Kellogg was hired as chief administrator of the Western Health Reform Institute and within a few months Kellogg changed the name to Battle Creek Sanitarium

[53] Though health reform was part of Adventist theology by 1865, it was not a uniquely Adventist cause. There was a larger contemporary health reform movement in the United States (Butler 1986).

(Spalding 1962; Knight 2004). Under Kellogg's guidance, Battle Creek Sanitarium achieved universal recognition and became the largest institution of its kind. Health reform and health care began their ascendency as integral parts of Adventist ministry. Adventism's entry into medicine was as influential on SDA organization as anything else (Butler 1986).

Today, the Adventist church is considered "a conservative Protestant body of evangelical Christians … known for their Sabbath observance, for their emphasis on maintaining health as part of religious duty and for their mission activities around the world" (Dederen 2000, 1). The SDA church has a four level organizational structure with authority coming from local church membership. The four levels, as outlined in the SDA Website (2008) are as follows:

1. "The local church made up of individual believers."
2. "The local conference, or local field/mission, made up of a number of local churches in a state, province, or territory."
3. "The union conference, or union field/mission, made up of conferences or fields within a larger territory (often a grouping of states or a whole country)."
4. "The General Conference represents the worldwide expression of the Seventh-day Adventist Church."

Since 1989, the General Conference has been located in Silver Spring, MD,[54] housing the church administration. For administrative purposes, the worldwide church has been divided into 13 divisions, made up from churches grouped by a collection of missions, fields, or states into unions of churches. The Divisions with their headquarters:

[54] Outside Washington D.C.

1. East-Central Africa - Nairobi, Kenya
2. Euro-Africa - Berne, Switzerland
3. Euro-Asia - Moscow, Russia
4. Inter-American - Miami, United States of America
5. North American - Silver Spring, United States of America
6. Northern Asia-Pacific - Koyang City, Korea.
7. Southern Africa-Indian Ocean - Harare Zimbabwe
8. South American - Brasilia, Brazil.
9. South Pacific - Wahroonga, Australia.
10. Southern Asia - Tamil Nadu, India.
11. Southern Asia-Pacific - Cavite, Philippines.
12. Trans-European - St. Albans, England.
13. West-Central Africa - Abidjan, Cote d'Ivoire.

Figure 33. SDA Church World Divisions[55]

[55] Source: General Conference of Seventh-day Adventist Website, Copyritght 2008.

As of December 31, 2008, the Seventh-day Adventist Church world statistics[56] were a follows:

- Churches 65,961
- Companies 62,430
- Church Membership 15,921,408
- Ordained Ministers, Active 16,615
- Total Active Employees 205,083

- Countries and Areas of the World as Recognized by the United Nations - 232
- Countries and Areas of the World in Which SDA Work is Established - 203

Educational Program
- Tertiary Institutions - 111
- Secondary Schools - 1,678
- Primary Schools - 5,763
- Total Enrollment - 1,545,464

Healthcare
- Hospitals and Sanitariums - 171
- Clinics and Dispensaries - 429

Contributions - In U.S. Dollars
- Tithe - $1,929,768,053
- Tithe Per Capita - $125.24
- Total Tithe and Offerings - $2,627,027,513
- Total Tithe and Offerings Per Capita - $170.50

It has been argued that the evangelical movement in Puerto Rico dates back to 1860 (Cabrera 1923; Bidot 1949) with the conversion of Antonio Bandillo. However, in 1868, Johanes Waldemar Zaccheus, a British immigrant to Vieques, began observing Anglican services. This small degree of religious liberty, provided by the Spanish Constitution of 1869 and confirmed by the 1876 constitution, led to the January 1873 consecration of an Anglican church in Ponce. This established the first Protestant church in Puerto Rico (Vega 1993). The arrival of American troops in 1898 introduced the island to this new religious and cultural dynamic on a much wider scale.

[56] Source: General Conference of Seventh-day Adventist Church World Church Facts and Figures, Copyright 2010.

David Trail, an American soldier and a Seventh-day Adventist, settled in Las Marias after the United States won the Spanish-American War. Trail wrote to the Seventh-day Adventist headquarters requesting that a missionary be sent to Puerto Rico. In response to his letter SDA leadership sent Albert Fisher to Puerto Rico in 1901, officially beginning the island's SDA presence. After a brief stint in San Juan, they moved to Mayagüez, on Puerto Rico's West Coast (Vega 1993).

After Mr. Fisher's passing, the SDA General Conference sent B.E. Connerly to continue the work. In April 1903, Connerly published the *El Centinela de la Verdad* (still in print as *El Centinela*), the first Protestant publication in Puerto Rico. On Saturday, December 17, 1904, the first Adventist church is organized in Mayagüez, PR with three members and the official Puerto Rican Mission was established in 1909, which included the Dominican Republic and the Virgin Islands. Today, with approximately 37,000 members, 300 churches, 12 high schools, two radio stations, two medical clinics, a university and a hospital, the Seventh-day Adventist church is present and active in Puerto Rico (Seventh-day Adventist Church Inter-American Division 2009) and is part of the Inter-American Division, as seen in Figure 34.

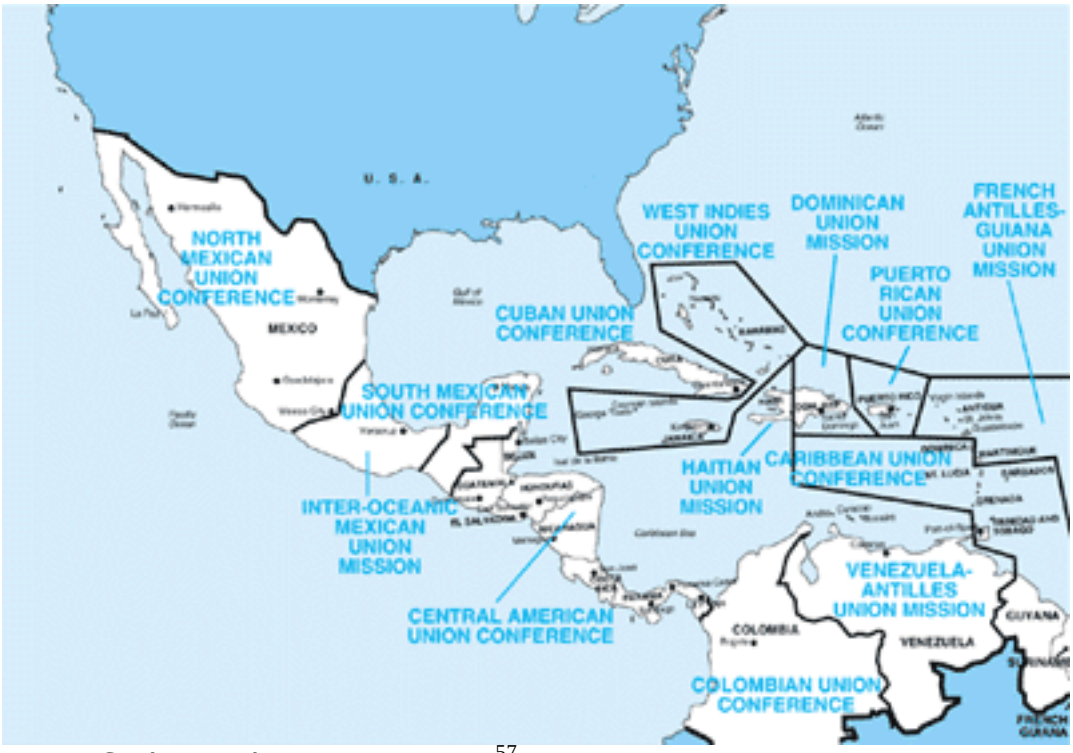

Figure 34. SDA Inter-American Division.[57]

The denomination's efforts have led to a global educational system that includes 7,600 schools, colleges and universities, with approximately 81,000 teachers and 1,500,000 students (GCSDA 2008). The SDA school system is considered to be the second-largest private school system in the world, second only to the Roman Catholic school system (Paulsen 2008). This focus on education is often vital to Adventism's missionary efforts.

The centralized form of church governance used by the SDA church generally eases access to many individual congregations and institutions, along with providing a central clearing house for church statistics such as membership, baptisms, tithe receipts and institutions. This community is best seen in the church's universally recognized[58] 28

[57] Source: General Conference of Seventh-day Adventist Website, Copyright 2008.
[58] Among SDA members, that is.

"Fundamental Beliefs" that have developed around familiar values, perspectives, practices and beliefs (Durkheim 1912; Gustafsson 1997; Henslin 2002).

Among these Fundamental Beliefs is the doctrine of the "The Gift of Prophecy" (#18), which in Adventist cosmology was manifested in the ministry of Ellen G. White (1827-1915). According to SDA theology, she is considered the Lord's messenger and her writings are an authoritative source of truth (GCSDA 2010). Along with her husband, James and retired ship captain Joseph Bates, she was part of early Adventism's leading triumvate (Butler 1986) and she would become instrumental in the origins of a major American sect (Numbers 2008). Though not as recognized as Joseph Smith (Latter-day Saints), Ann Lee (Shakers), or Mary Baker Eddy (Christian Science) (Butler 1991), White's writings number over 100 printed volumes and through the continuing efforts of the SDA church, she has become the most translated woman writer and the most translated American author (White Estate 2000).

Along with White's deliberations on religious and lifestyle issues, her writings include numerous economic observations. When writing about the benefits of country living over city living, White wrote that the "sense of being owners of their own homes would inspire them with a strong desire for improvement ... their children would be educated to habits of industry and economy … they would feel that they are men, not slaves, and would be able to regain to a great degree their lost self-respect and moral independence" (1952, 373). Incapable of escaping Calvin, she wrote that "Religious duty and the highest human prudence in business lines must be co-mingled" (381) and "Obedience to God's law is the great incentive to industry, economy, truthfulness, and just dealing" (489). In counsel to businessmen she prompted them to do their business in

a manner that would glorify God and to be diligent in their work (White 1888) and that a Christian's business is a part of his service to God (White 1903).

Studying the SDA church has other academic attractions. Bull (1989, 177) contends that "Seventh-day Adventism is one of the most important religious movements native to the United States" and is the "most vital group to emerge from the debacle of the Great Disappointment." Yet, it is often treated as a Millerism sidebar, receiving scant scholarly attention. Also, Seventh-day Adventism is a "New World" faith that makes an interesting comparison to the "Old World" Roman Catholicism that is the backbone of the Puerto Rican culture. This empirical juxtaposition makes for a potentially more interesting comparison than merely using another "Old World" Christian, or even Protestant, tradition.

Methodology

While the religion and economics connections have not been the topic of much scholarly analysis (Pita Barros and Garoupa 2002), there is empirical inspiration for this research. Sales (1972) investigated the effects of economic conditions on the annual conversion rates of eight denominations during the 1920s and 30s. He found that difficult economic conditions increase conversion rates to authoritarian churches, while better economic times increase conversion rates to nonauthoritarian churches. These findings were confirmed by McCann (1999) who researched church membership growth rates for the decades 1955-1964, 1965-1974, and 1975-1984, during what the author characterized as "threatening times." By using data over three decades, Gruber (2004, 1) investigates the impact of charitable subsidies on religious participation, finding evidence that religious giving and religious attendance are substitutes, specifically that, "larger

subsidies to charitable giving lead to more religious giving, but less religious attendance, with an implied elasticity of attendance with respect to religious giving." Beckworth (2009) found a strong countercyclical component to religious participation in evangelical Protestant denominations while investigating the relationship between macroeconomic conditions and religious participation by U.S. Protestants. Meanwhile, for mainline Protestants he found a procyclical component to religious participation. To add to this conversation regarding economics and religion the following question will be asked: Research Question: How does the Puerto Rican economy impact growth and giving in the Seventh-day Adventist church in Puerto Rico?

Hypotheses

1. Growth, as measured by membership, in the Seventh-day Adventist Church in Puerto Rico remains unaffected by economic downturns in Puerto Rico.
2. Giving, as measured by per capita tithe giving, in the Seventh-day Adventist Church in Puerto Rico is adversely affected by economic downturns in Puerto Rico.

To afford additional perspective to the results from Puerto Rico, the same regression models were applied to data from the Jamaica and Hawai'i.

Jamaica

Jamaica, an island nation of the Greater Antilles, is situated in the Caribbean Sea, about 90 miles south of Cuba, and 120 miles west of Hispaniola. After discovering the island in 1494, Christopher Columbus claimed Jamaica for Spain. Initially a Spanish possession known as Santiago, it became English (and later British) in 1655. It achieved full independence in 1962 (Jamaica National Heritage Trust 2005).

Jamaica became one of the world's leading sugar-exporting, slave-dependent nations during its first 200 years of British rule. Major sectors of the Jamaican economy include agriculture, mining, manufacturing, tourism, and financial and insurance services. Tourism and mining are the leading earners of foreign exchange. Christianity is the largest religion practiced in Jamaica and at 11% of the population; the Seventh-day Adventist Church is the second biggest denomination (Jamaica National Heritage Trust 2005).

Hawai'i

Strategically important to United States global defense system and serving as a transportation hub of the Pacific basin, Hawai'i became the 50th U.S. state on August 21, 1959. Located in the central Pacific Ocean, Hawai'i is a group of volcanic islands approximately 2,400 miles west of San Francisco, California. Landing on Kauai on January 20, 1778, British explorer Captain James Cook is generally credited as the first European to discover Hawai'i (History Channel 2010).

With an estimated population of 1.3 million people, Hawai'i has eight major islands and 124 islets. Though tourism is its largest industry, agriculture remains a major part of the local economy and the Mauna Kea Observatory has contributed to Hawai'i becoming a major center of astronomy. Yet among U.S. states, Hawai'i ranks low in terms of personal income (History Channel 2010).

Data

Independent Variables

- Puerto Rico Economic Data as provided by the Junta de Planificación de Puerto Rico (Puerto Rico Planning Board): Puerto Rico average family income from 1947-2008. The data was acquired in September/October 2009.
- Puerto Rico and Jamaica Economic Data as provided by the World Bank: Per capita Gross Domestic Product from 1960-2001. The data was acquired in September/October 2009.
- Puerto Rico and Hawai'i Economic Data as provided by the United States Department of Labor's Bureau of Labor Statistics: Unemployment from 1980-2008. The data was acquired in September/October 2009.
- Hawai'i Economic Data as provided by the United States Department of Commerce: Bureau of Economic Analysis Per capita GDP and Per capita personal income. The data was acquired in June 2010.
- Jamaica Economic Data as provided by the World Bank: Per capita Gross National Income and Employment from 1960-2001. The data was acquired in June 2010. This source provided different data than what was available for Puerto Rico and Hawai'i, thus some adjustments were made. For the Per capita income, the Per Capita Gross National Income (GNI) was substituted. For the employment data, the percent of the workforce employed was utilized.

Dependent Variables

- Puerto Rico, Jamaica and Hawai'i Seventh-day Adventist Church data as provided by the General Conference of Seventh-day Adventist Annual Reports

1931-2007: Membership, baptism, tithe and tithe/capita. The data was acquired in September/October 2009.

Statistical Tests

Correlation and basic regression analysis were employed to examine the associations between Puerto Rican, Jamaican and Hawaiian macro-economic indicators and SDA church growth and giving metrics. To make quantitative measurements of this potential relationship, basic regressions are run using current and lagged macroeconomic variables. With SDA church data available only at an annual frequency, all the regressions are estimated using annual data. Also, to avoid unit root problems, all variables were turned into growth rates. For the baptism variable, a simple baptism-to-membership ratio was used.[59]

The regression analysis determined which independent variables had a statistically significant influence on the dependent variables. These models were used to determine which independent variables would be utilized in a multivariate regression analysis. Table 22 provides a list of all the regressions and Appendix C provides full details of all regression results.

Running an ordinary least squares regression using STATA 11 Data Analysis and Statistical Software, this chapter employed three statistical tests to determine the relationships between the dependent and independent variables. The three tests are as follows:

[59] This baptism-to-membership ratio helped determine how effective the SDA church was in proselytizing new members. This differs from simply looking at membership numbers in that membership includes not just new members, but also members that have left the church and current members that have moved into the conference from other locales.

1. R^2, also called the coefficient of determination, is the proportion of variation in the dependent variable about its mean explained by the independent variable(s) in the model. The closer R^2 is to 1, the better job the model does in explaining the variation in the dependent variable and the greater the model's predictive ability.
2. T-stat is a test to determine a regression model's usability. It measures how strongly the independent variable explains variations in the dependent variable. If the slope is significantly different than zero, then we can use the model to help predict the dependent variable for any value of the independent variable. It confirms that the independent variable belongs in the model; the larger the t-stat the better the independent variable's explanatory power. If you regression is based on a large sample (typically 30+ observations), a t-stat greater than 2 (or less than -2) indicates the coefficient is significant with >95% confidence. A t-stat greater than 1.68 (or less than -1.68) indicates the coefficient is significant with >90% confidence.
3. The P value is used to determine if the independent variables reliably predicts the dependent variable by measuring the probability that the independent variable has nothing to do with the dependent variable. As compared to the alpha (0.05 for the purposes of this chapter, which is typical), if the p value is smaller then it can be concluded that the independent variable reliably predicts the dependent variable. Low p value improves fit of the model, while greater than 0.05 means that the coefficient may be only "accidently" significant. If the P value is higher than .05, a strong argument can be made for eliminating this particular independent variable from a model because it isn't statistically significant. The P value says

nothing about the size of the effect that the independent variable is having on your dependent variable. It is possible to have a highly significant result for a small effect.

Table 22

Regression Models

Dependent Variable	Independent Variable
Membership percent change	Per Capita Income - No lag
Membership percent change	Per Capita Income - 1 lag
Membership percent change	Per Capita Income - 2 lags
Membership percent change	Per Capita GDP - No lag
Membership percent change	Per Capita GDP - 1 lag
Membership percent change	Per Capita GDP - 2 lags
Membership percent change	Employment - No lag
Membership percent change	Employment - 1 lag
Membership percent change	Employment - 2 lags
Tithe percent change	Per Capita Income - No lag
Tithe percent change	Per Capita Income - 1 lag
Tithe percent change	Per Capita Income - 2 lags
Tithe percent change	Per Capita GDP - No lag
Tithe percent change	Per Capita GDP - 1 lag
Tithe percent change	Per Capita GDP - 2 lags
Tithe percent change	Employment - No lag
Tithe percent change	Employment - 1 lag
Tithe percent change	Employment - 2 lags
Baptisms-to-membership ratio	Per Capita Income - No lag
Baptisms-to-membership ratio	Per Capita Income - 1 lag
Baptisms-to-membership ratio	Per Capita Income - 2 lags
Baptisms-to-membership ratio	Per Capita GDP - No lag
Baptisms-to-membership ratio	Per Capita GDP - 1 lag
Baptisms-to-membership ratio	Per Capita GDP - 2 lags
Baptisms-to-membership ratio	Employment - No lag
Baptisms-to-membership ratio	Employment - 1 lag
Baptisms-to-membership ratio	Employment - 2 lags
Hawai'i Multivariate Regressions	
Baptisms	Per Capita Income - 2 lags Per Capita GDP - 2 lags Employment - 2 lags

Table 22 (Continued).

Dependent Variable	Independent Variable
Jamaica Multivariate Regressions	
Tithe	Per Capita Income - No lags
	Per Capita GDP - No lags
Puerto Rico Multivariate Regressions	
Membership	Per Capita Income - 2 lags
	Per Capita GDP - 2 lags
Tithe	Per Capita Income - No lag
	Employment - 1 lag
Baptism	Per Capita Income - 2 lags
	Per Capita GDP - 2 lags

Puerto Rico Results

The percent changes in the variables are seen in Figures 35-40.

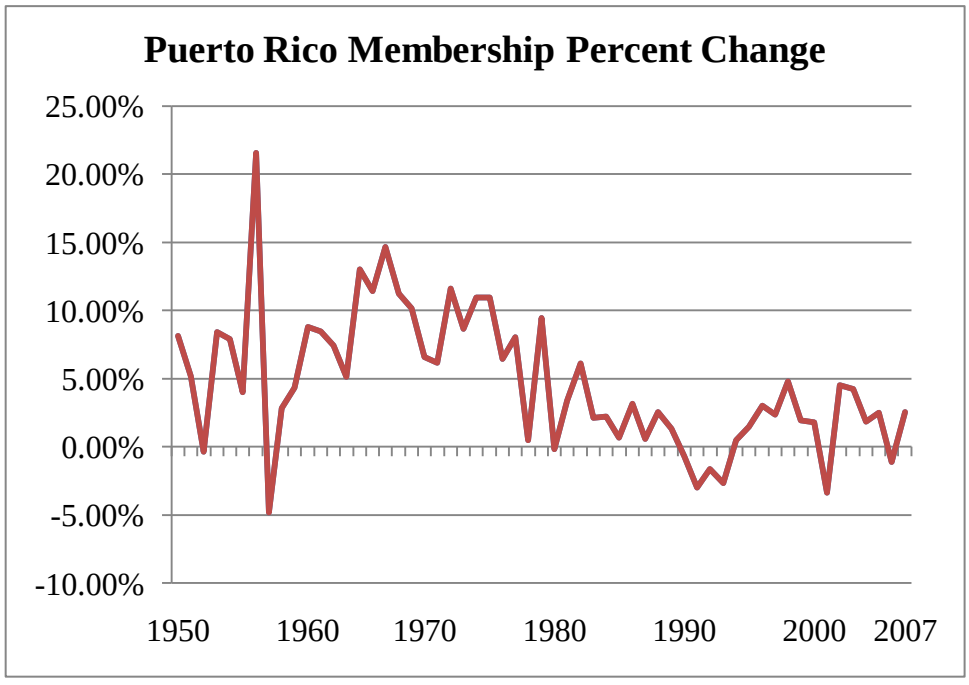

Figure 35. Puerto Rico SDA Church Membership Percent Change.

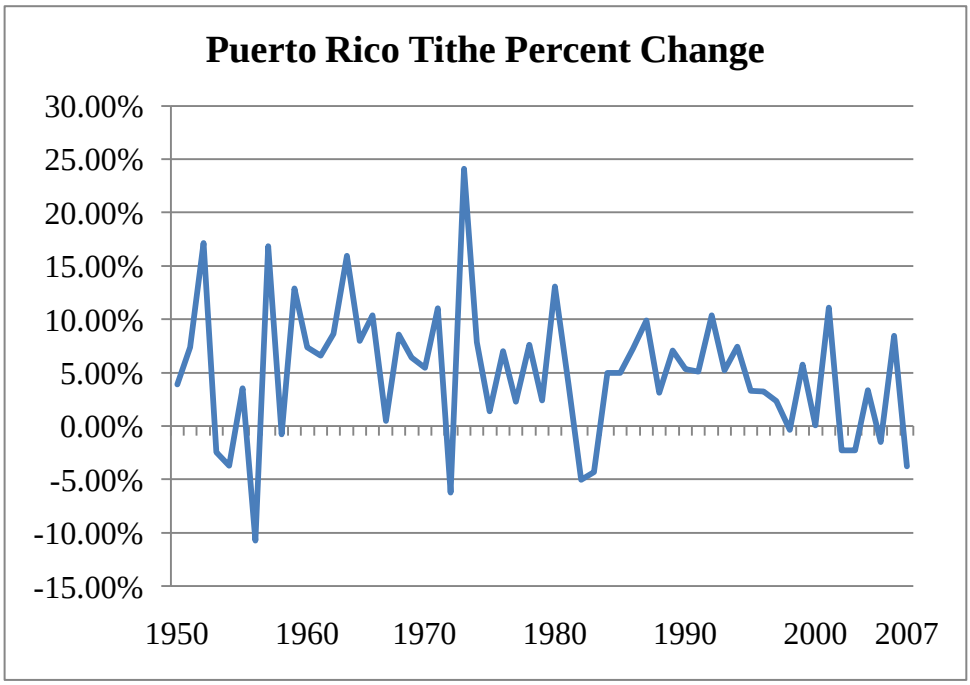

Figure 36. Puerto Rico SDA Church Tithe Percent Change.

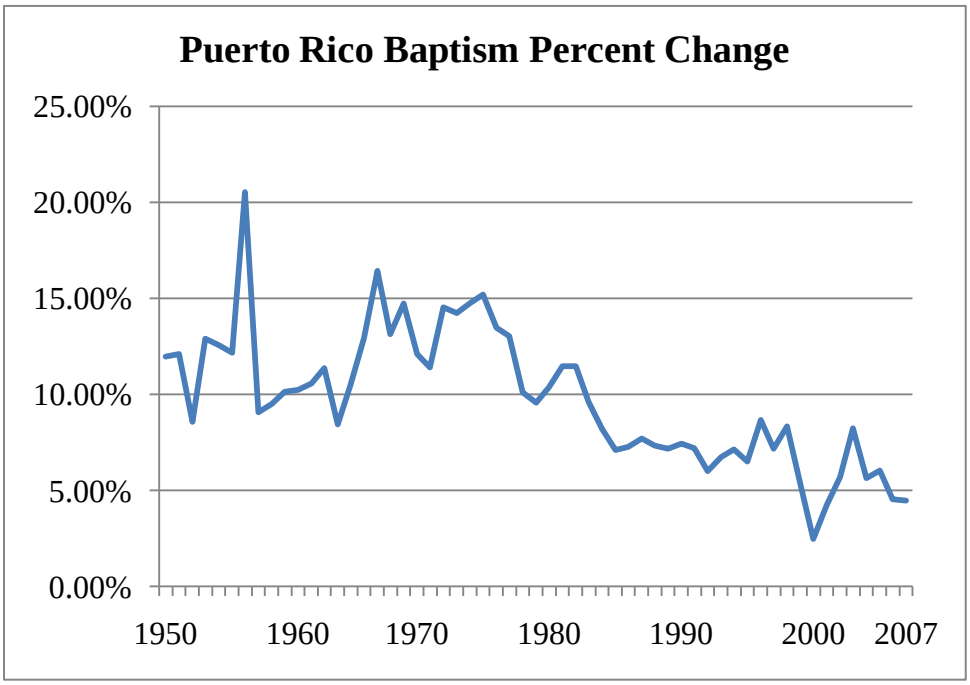

Figure 37. Puerto Rico SDA Church Baptism Percent Change.

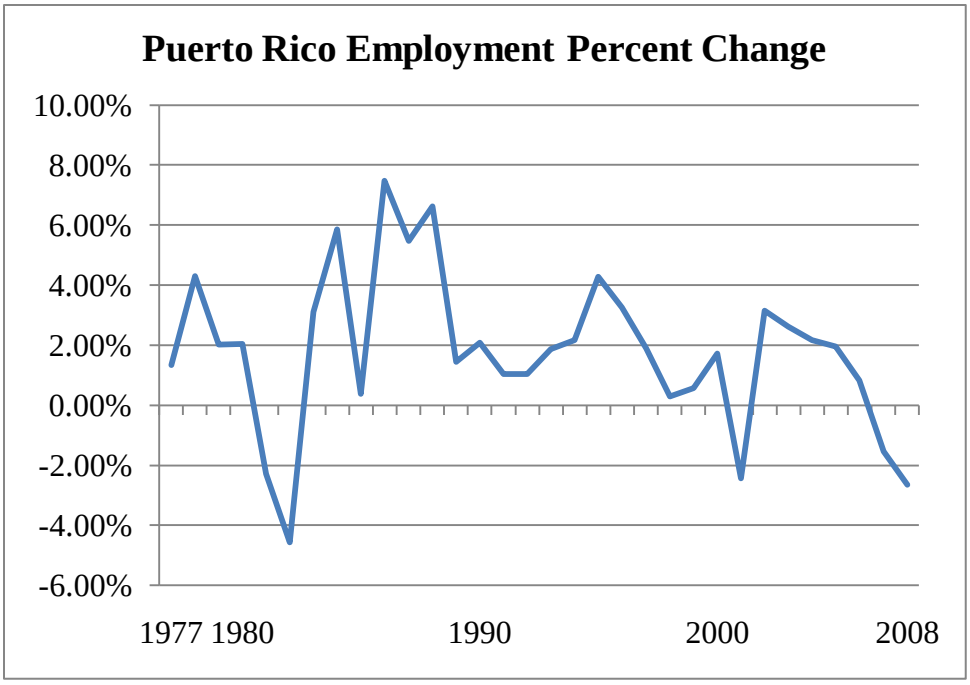

Figure 38. Puerto Rico Employment Percent Change.

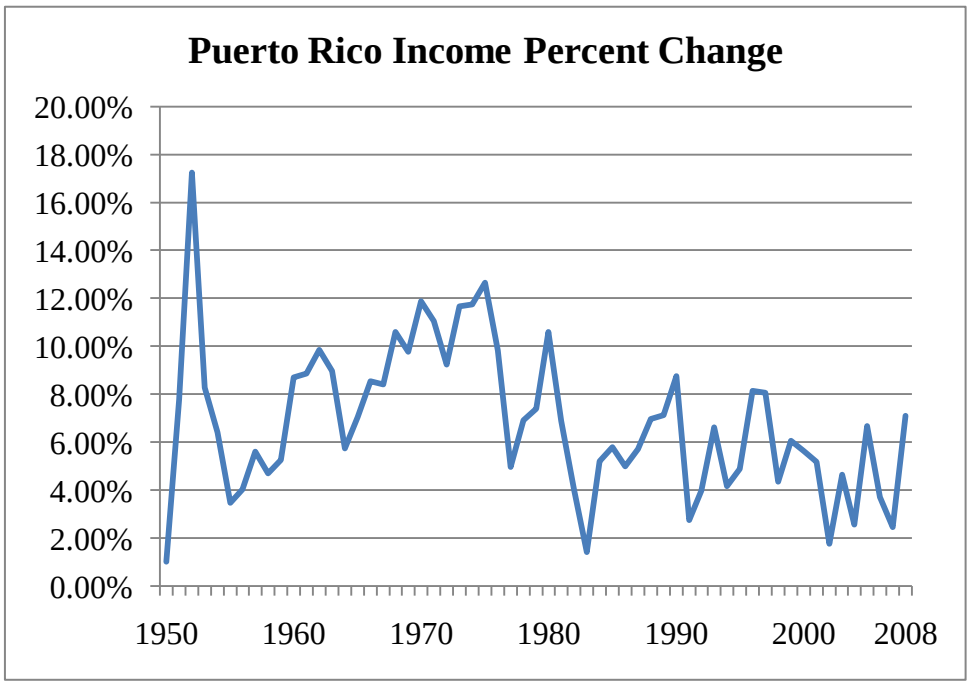

Figure 39. Puerto Rico Income Percent Change.

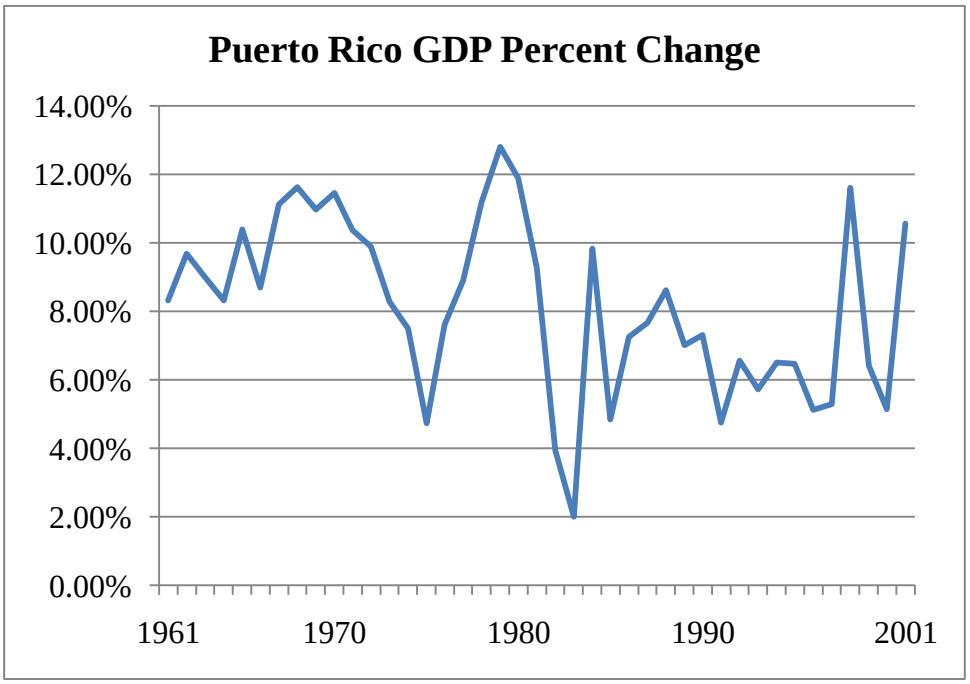

Figure 40. Puerto Rico Gross Domestic Product Percent Change.

Table 23

Significant Puerto Rico Regression Results

Dependent Variable	Independent Variable	R^2	t-stat	p-value
Membership	Per Capita Income – 1 lag	0.1263	3.26	0.002
Membership	Per Capita Income – 2 lags	0.1745	4.82	0.000
Membership	Per Capita GDP – No lag	0.1458	2.52	0.016
Membership	Per Capita GDP – 1 lag	0.1500	2.90	0.006
Membership	Per Capita GDP – 2 lags	0.1726	3.33	0.002
Tithe	Per Capita Income – No lag	0.1883	3.62	0.001
Tithe	Employment – 1 lag	0.1819	3.41	0.002
Baptisms	Per Capita Income – No lag	0.0986	2.70	0.009

Table 23 (Continued).

Dependent Variable	Independent Variable	R^2	t-stat	p-value
Baptisms	Per Capita Income – 1 lag	0.0745	2.11	0.039
Baptisms	Per Capita Income – 2 lags	0.2686	5.82	0.000
Baptisms	Per Capita GDP – No lag	0.1170	2.22	0.032
Baptisms	Per Capita GDP – 1 lag	0.1411	2.82	0.008
Baptisms	Per Capita GDP – 2 lags	0.2081	3.19	0.003

Based on the results listed in Table 23, it was noted that:

- Of the variance in Membership, 12.63% can be predicted from Per Capita Income – 1 lag.
- Of the variance in Membership, 17.45% can be predicted from Per Capita Income – 2 lags.
- Of the variance in Membership, 14.58% can be predicted from Per Capita GDP – No lag.
- Of the variance in Membership, 15.00% can be predicted from Per Capita GDP – 1 lag.
- Of the variance in Membership, 17.26% can be predicted from Per Capita GDP – 2 lags.
- Of the variance in Tithe, 18.83% can be predicted from Per Capita Income – No lag.
- Of the variance in Tithe, 18.19% can be predicted from Employment – 1 lag.
- Of the variance in Baptisms, 9.86% can be predicted from Per Capita Income – No lag.

- Of the variance in Baptisms, 7.45% can be predicted from Per Capita Income – 1 lag.
- Of the variance in Baptisms, 26.86% can be predicted from Per Capita Income – 2 lags.
- Of the variance in Baptisms, 11.70% can be predicted from Per Capita GDP – No lag.
- Of the variance in Baptisms, 14.11% can be predicted from Per Capita GDP – 1 lag.
- Of the variance in Baptisms, 20.81% can be predicted from Per Capita GDP – 2 lags.

Table 24

Puerto Rico Multivariate Model Results

Dependent Variable	Independent Variables	R^2	p-value
Membership	Per Capita Income - 2 lags Per Capita GDP - 2 lags	0.2995	0.0000
Tithe	Per Capita Income - No lag Employment - 1 lag	0.2421	0.0046
Baptism	Per Capita Income - 2 lags Per Capita GDP - 2 lags	0.4612	0.0000

Based on the results listed in Table 24, it was noted that:

- Of the variance in Membership, 29.95% can be predicted from Per Capita Income (2 lags) and Per Capita GDP (2 lags).

- Of the variance in Tithe, 24.21% can be predicted from Per Capita Income (No lag) and Employment (1 lag).
- Of the variance in Baptism, 46.12% can be predicted from Per Capita Income (No lag) and Employment (1 lag).

Hawai'i Results

The percent changes in the variables are seen in Figures 41-46.

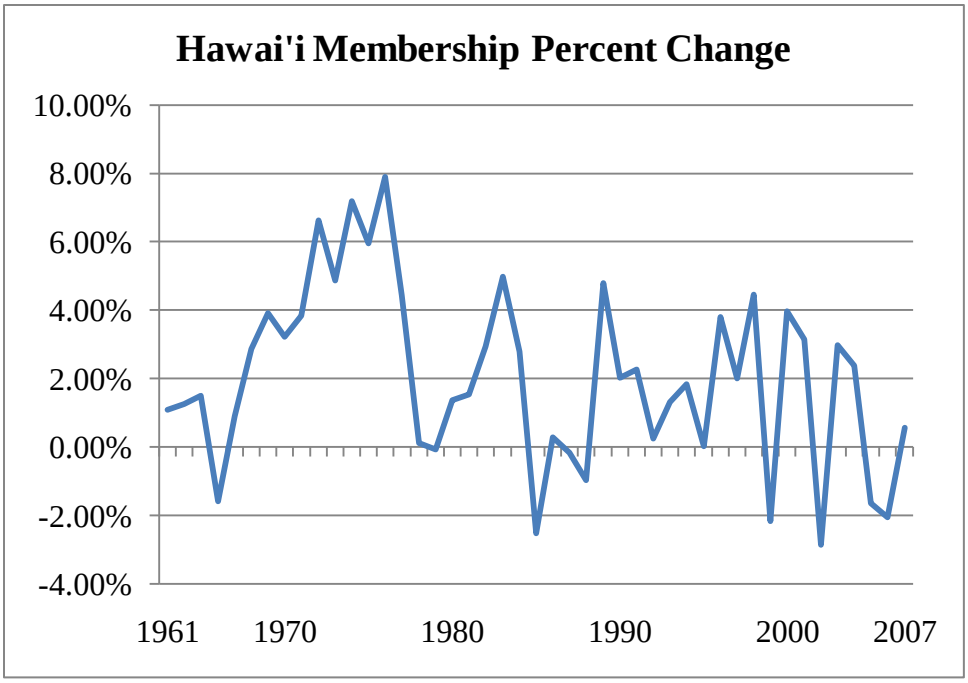

Figure 41. Hawai'i SDA Church Membership Percent Change.

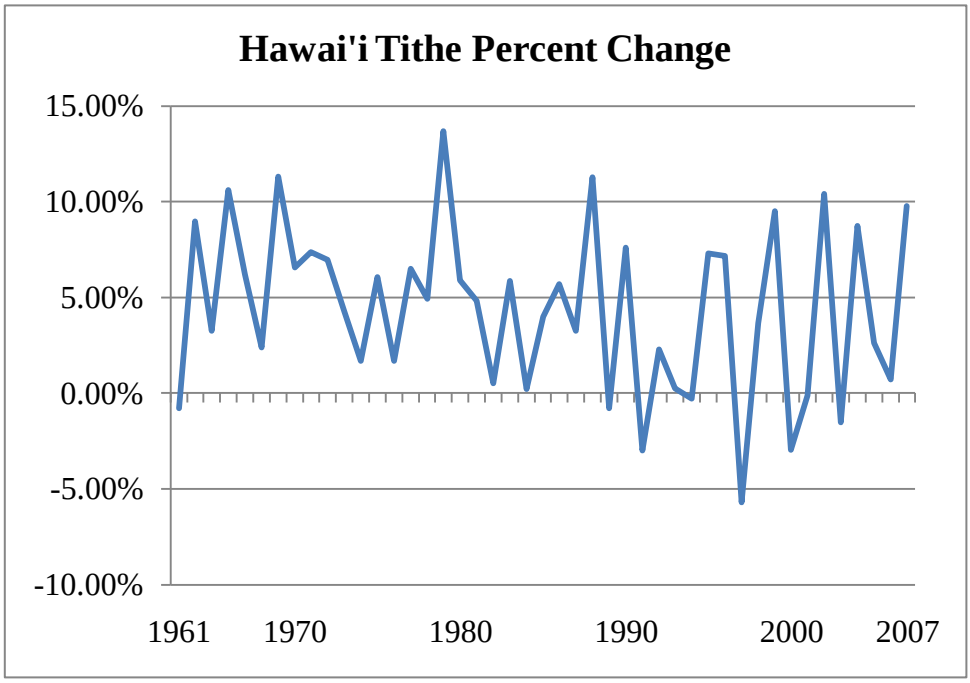

Figure 43. Hawai'i SDA Church Tithe Percent Change.

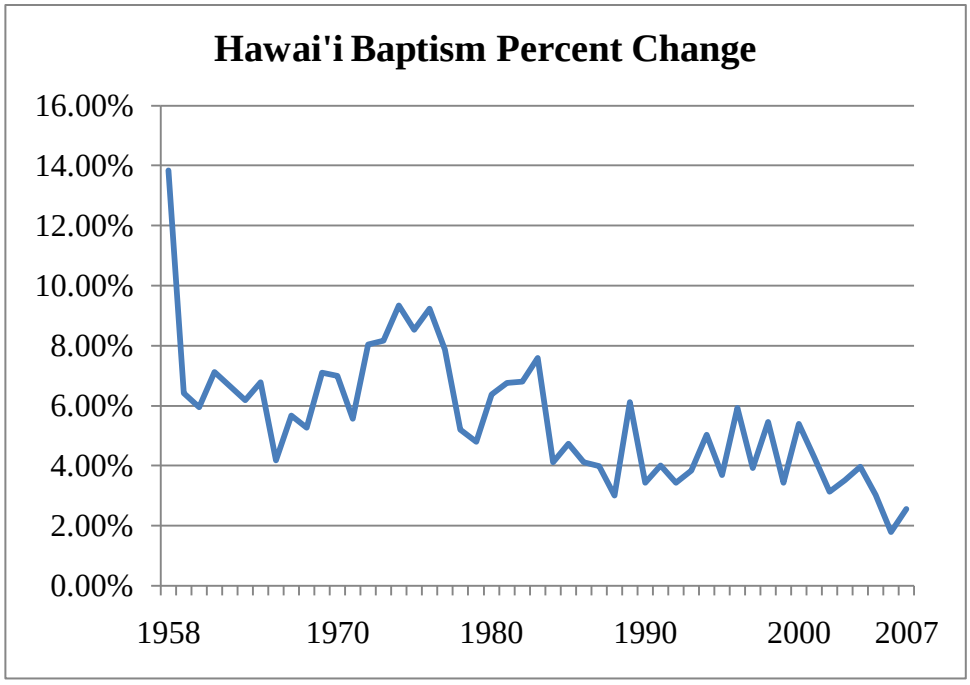

Figure 42. Hawai'i SDA Church Baptism Percent Change.

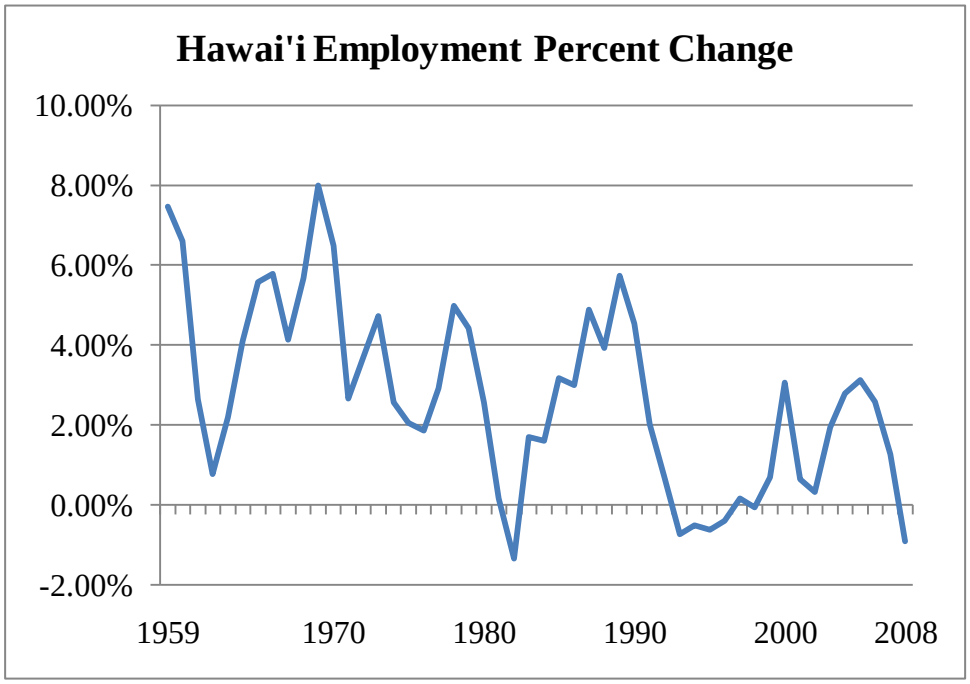

Figure 44. Hawai'i Employment Percent Change.

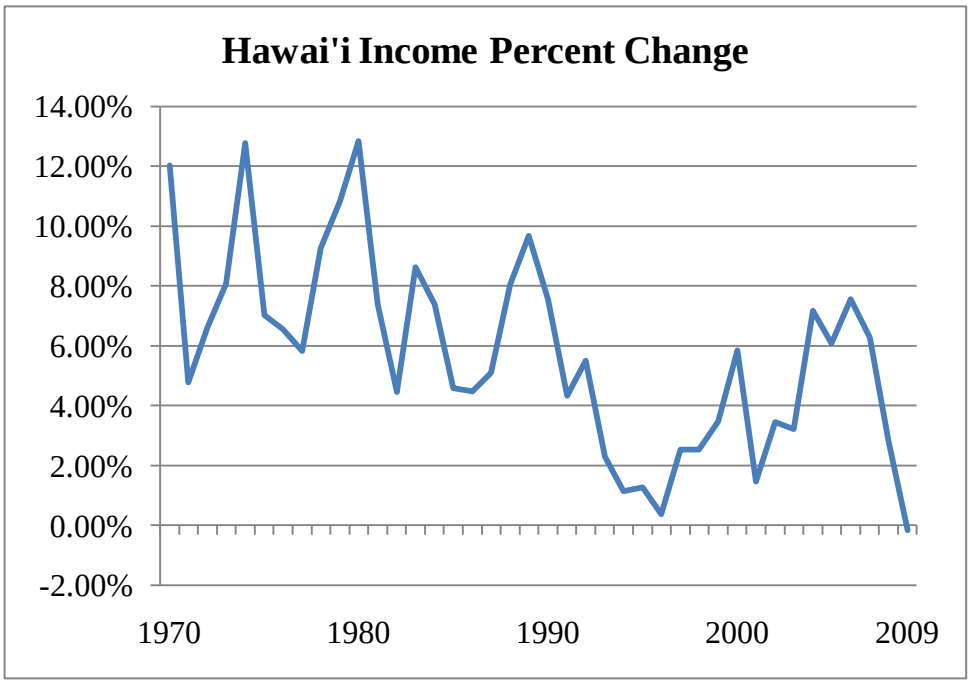

Figure 45. Hawai'i Income Percent Change.

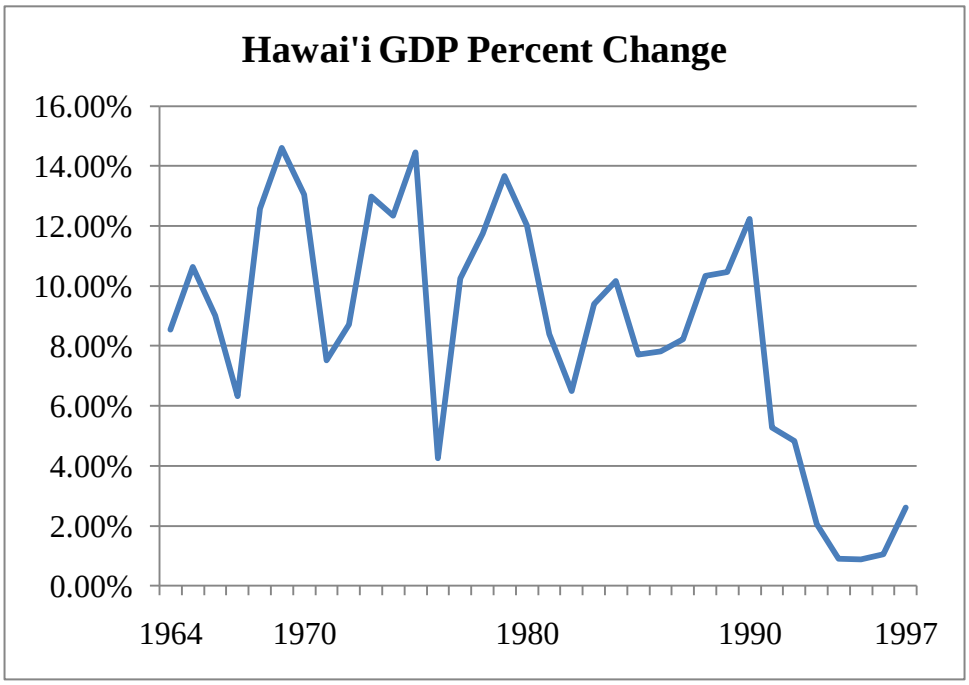

Figure 46. Hawai'i Gross Domestic Product Percent Change.

Table 25

Significant Hawai'i Regression Results

Dependent Variable	Independent Variable(s)	R^2	t-stat	p-value
Tithe	Per Capita GDP - No lag	0.1908	2.31	0.028
Baptisms	Per Capita Income - No lag	0.1438	3.12	0.004
Baptisms	Per Capita Income - 1 lag	0.1123	2.97	0.005
Baptisms	Per Capita Income - 2 lags	0.1960	3.53	0.001
Baptisms	Per Capita GDP - No lag	0.1250	2.32	0.027
Baptisms	Per Capita GDP - 1 lag	0.1286	2.51	0.017
Baptisms	Per Capita GDP - 2 lags	0.1620	3.13	0.004
Baptisms	Employment - 2 lags	0.0890	3.07	0.004

Based on the results listed in Table 25, it was noted that:

- Of the variance in Tithe, 19.08% can be predicted from Per Capita GDP - No lag.
- Of the variance in Baptisms, 14.38% can be predicted from Per Capita Income - No lag.
- Of the variance in Baptisms, 11.23% can be predicted from Per Capita Income - 1 lag.
- Of the variance in Baptisms, 19.60% can be predicted from Per Capita Income - 2 lags.
- Of the variance in Baptisms, 12.50% can be predicted from Per Capita GDP - No lag.
- Of the variance in Baptisms, 12.86% can be predicted from Per Capita GDP - 1 lag.
- Of the variance in Baptisms, 16.20% can be predicted from Per Capita GDP - 2 lags.
- Of the variance in Baptisms, 8.90% can be predicted from Employment - 2 lags.

Table 26

Hawai'i Multivariate Model Results

Dependent Variable	Independent Variables	R^2	p-value
Baptisms	Per Capita Income - 2 lags Per Capita GDP - 2 lags Employment - 2 lags	0.2187	0.0331

Based on the results listed in Table 26, it was noted that:

- Of the variance in Baptisms, 21.87% can be predicted from Per Capita Income (2 lags), Per Capita GDP (2 lags) and Employment (2 lags).

Jamaica Results

The percent changes in the variables are seen in Figures 47 through 52.

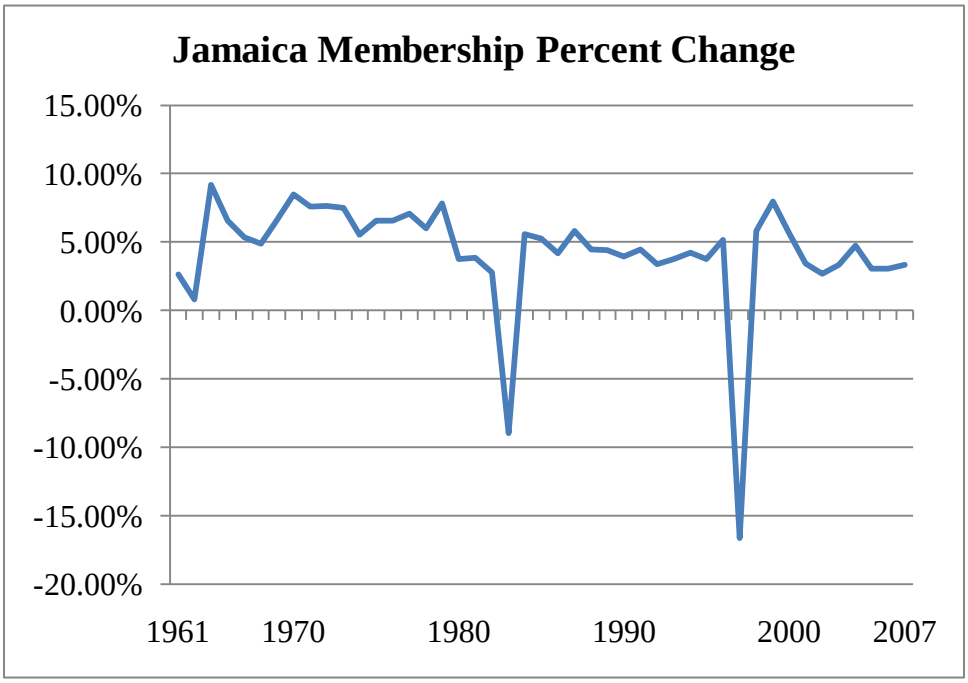

Figure 47. Jamaica SDA Church Membership Percent Change.

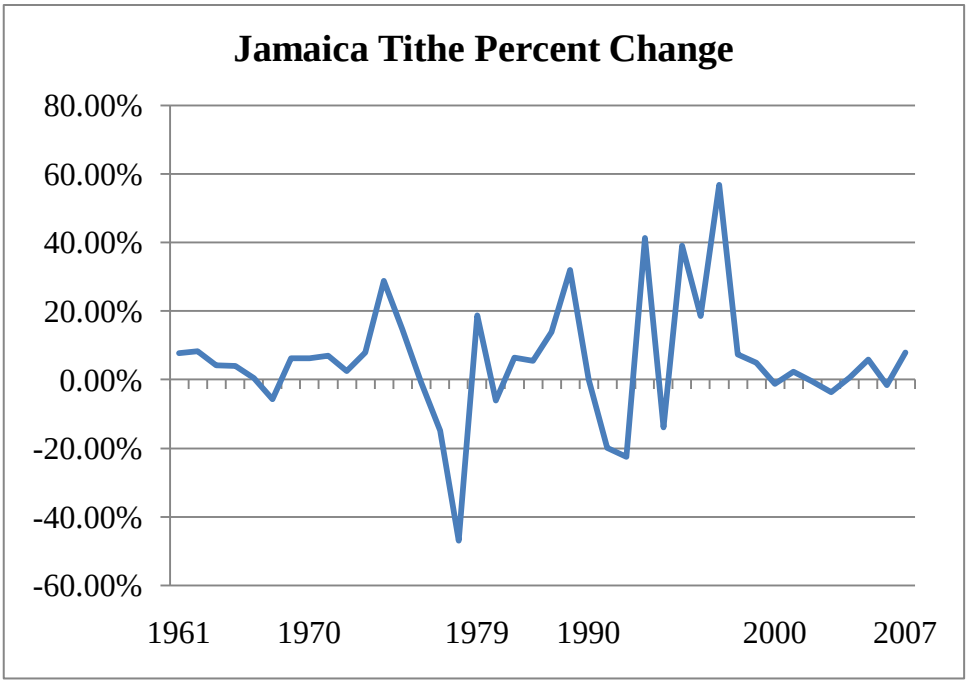

Figure 48. Jamaica SDA Church Tithe Percent Change.

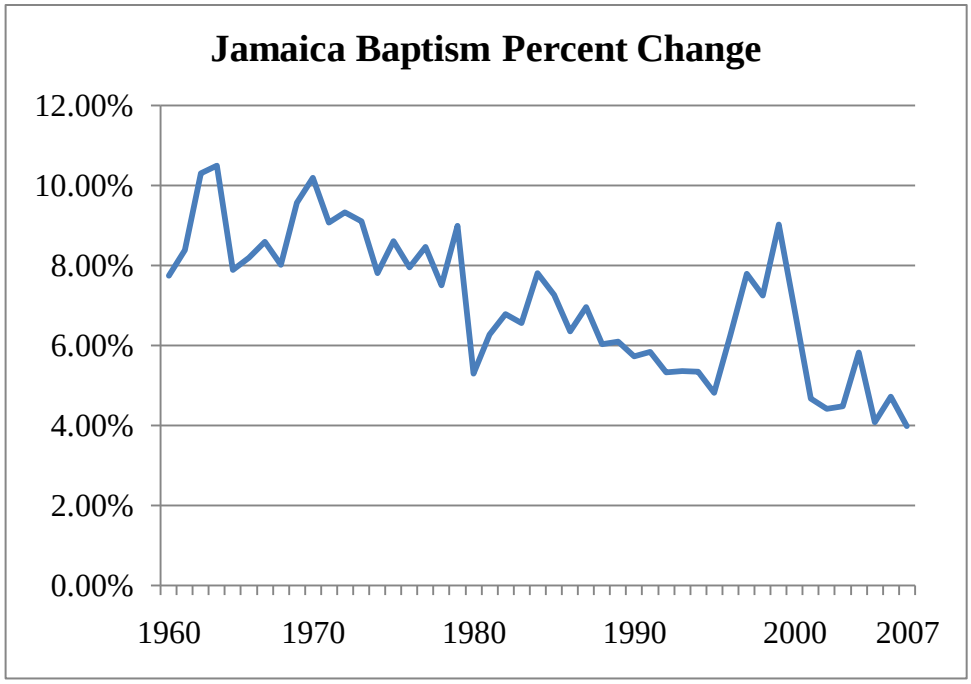

Figure 49. Jamaica SDA Church Baptism Percent Change.

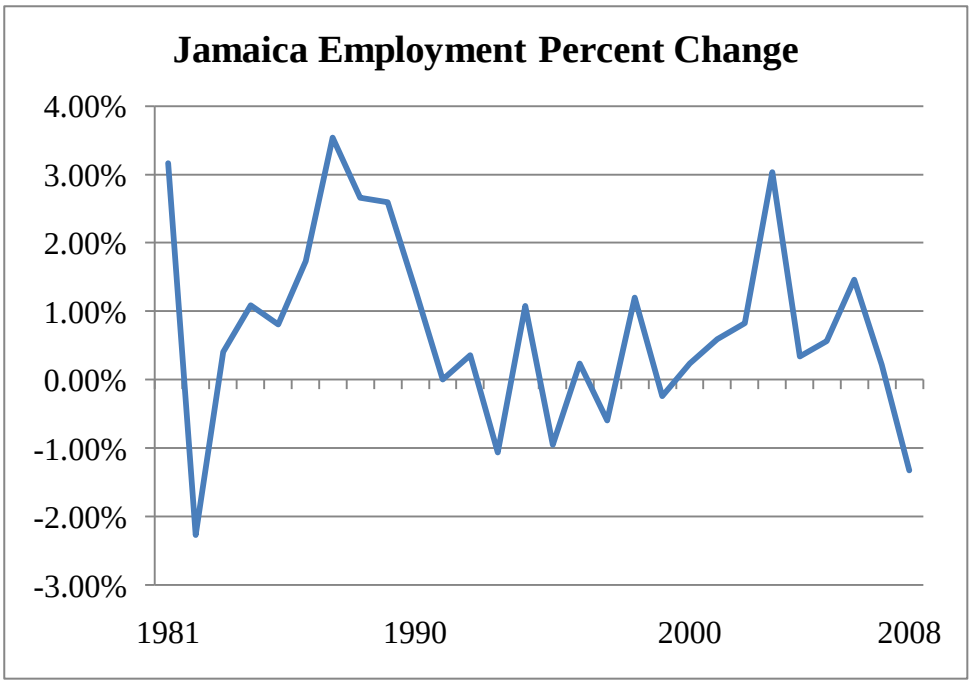

Figure 50. Jamaica Employment Percent Change.

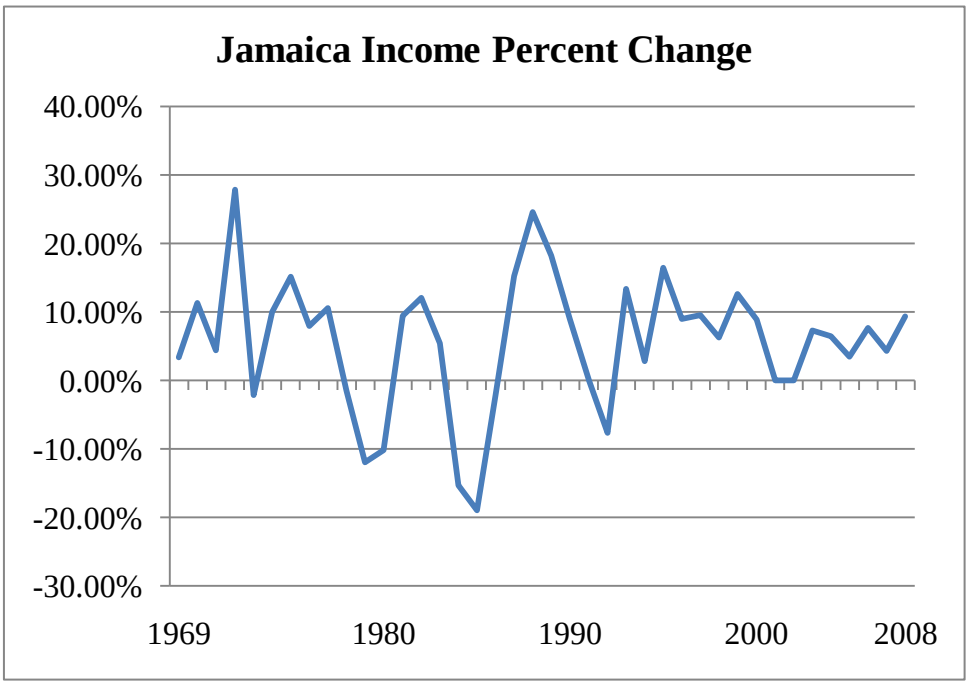

Figure 51. Jamaica Income Percent Change.

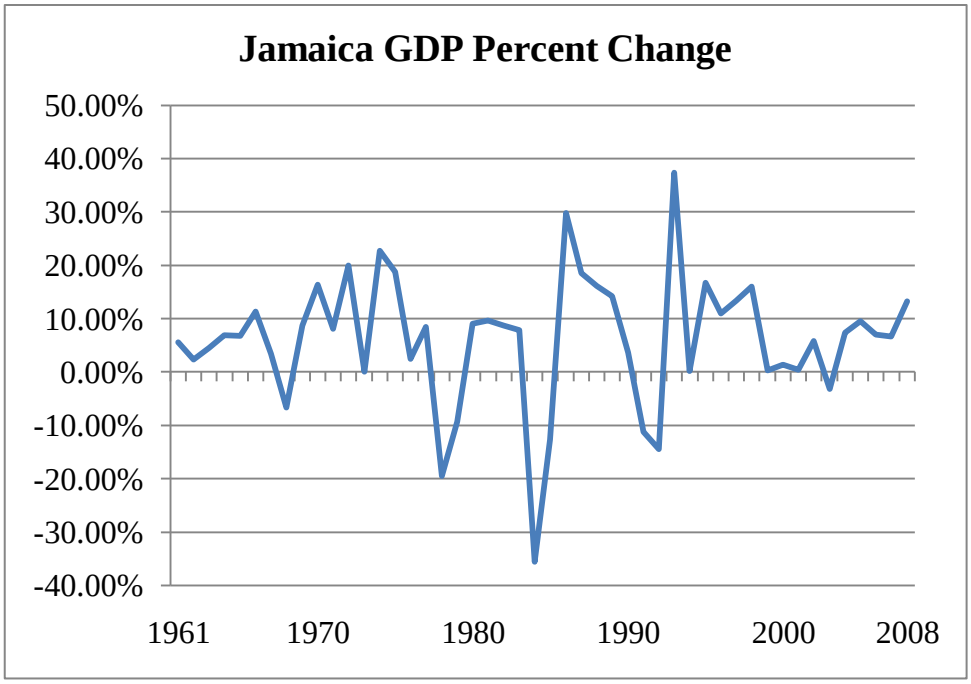

Figure 52. Jamaica Gross Domestic Product Percent Change.

Table 27

Significant Jamaica Regression Results

Dependent Variable	Independent Variable	R^2	t-stat	p-value
Tithe	Per Capita Income - No lag	0.1499	2.34	0.026
Tithe	Per Capita GDP - No lag	0.4485	4.65	0.000

Based on the results listed in Table 27, it was noted that:

- Of the variance in Tithe, 14.99% can be predicted from Per Capita Income - No lag.
- Of the variance in Tithe, 44.85% can be predicted from Per Capita GDP - No lag.

Table 28

Jamaica Multivariate Regression Results

Dependent Variable	Independent Variables	R^2	p-value
Tithe	Per Capita Income - No lags Per Capita GDP - No lags	0.4529	0.0004

Based on the results listed in Table 28, it was noted that:

- Of the variance in Tithe, 45.29% can be predicted from Per Capita Income (No lags) and Per Capita GDP (No lags).

Analysis

Though considered very approximate, the use of tithe to estimate economic activity has precedence (Ladurie and Goy 1982; Kain and Oliver 1995; Newland 2002; Dodds 2004, 2007). Dahl and Ransom (1999) observed how the definition of income in regards to tithing depends on an individual's religious and financial incentives through surveying

1,200 members of the Mormon Church[60] and found little evidence that an individual's financial situation influences beliefs regarding titheable income. It was expected that changes in Seventh-day Adventist tithing should closely mirror macroeconomic changes and indeed that is what the models suggest. In all three areas under study, at least one economic indicator had a significant effect on SDA tithing. Often this effect was contemporaneous. This is not surprising, given that tithing is a function of income and it stands to reason that economic factors would directly impact giving.

Sales (1972) concluded that during economically threatening years the rate of conversions to authoritarian churches increased, and the rate of conversions to nonauthoritarian churches decreased. Only churches with certain qualities become more attractive during threatening times, whereas other churches lose their appeal. With the Adventist church classified as authoritarian, it was expected that changes in SDA membership and baptisms would reflect economic-driven changes in religious participation. Specifically, that membership and baptisms in the SDA church would be countercyclical; economy goes down, membership and baptisms go up. That is not what this chapter's models describe. Instead, the models suggest a procyclical reaction to macroeconomic conditions in Puerto Rico, Hawai'i and Jamaica.

The substitution and income effect illuminates the changing opportunity cost of religious participation during the business cycle. An example would include when individuals find increased economic opportunities during an economic expansion. If the substitution effect dominates their labor supply decision, then religious participation such as church attendance becomes increasingly costly as they forgo potential earnings. Thus

[60] The LDS church is similarly authoritarian to the SDA church.

individuals will substitute out of religious participation. This suggests a countercyclical component to religious participation. Conversely, the potential for higher earnings may actually lead to more religious participation if the income effect dominated. If the economic expansion increased individual wealth, a similar response would occur. This suggests a procyclical component to religiosity.

Past research suggests that evangelical Protestant churches should benefit most from recessions while mainline Protestant churches should benefit most from economic booms (Beckworth 2009). That is, in response to economic conditions there tends to be a substitution effect in evangelical[61] churches and an income effect in mainline churches. Thus, the literature would suggest that one would witness a substitution effect for Adventists, not the income effect apparent in this chapter's findings. Findings suggesting that Seventh-day Adventism acts as an inferior[62] good in the United States, while acting as a normal[63] good in Puerto Rico, Hawai'i and Jamaica.

Two possible explanations are presented. First, the traditional results regarding the countercyclical/procyclical properties of denominations are drawn from the United States. What if it is different for evangelicals in developing economies? In his research of Adventist missionary efforts, Lawson (1998) found that new Adventists have experienced widespread economic advancement and that recent proselytes were often drawn to Adventism because it is believed to offer development opportunities; this despite that a principal Adventist doctrine is the imminent return of Jesus Christ and its

[61] A classification that would include the SDA church.
[62] Decreases in demand when consumer income rises.
[63] Increases in demand when consumer income rises.

attendant ending of the world[64]. Because of Adventism's tendency to make education a keystone of their evangelization (Lewellen 1979) and give a high priority to developing schools, new members are attracted to the upward mobility often afforded by a formal education (Stoll 1990; Lawson 1998). As a result of missionary efforts, it is often evangelical Protestants that are upwardly mobile in developing economies; with High Demand/High Hierarchy belief systems expecting that it's more prosperous believers display more religiosity. Thus it could be that, in emerging economies, evangelical Protestant churches benefit most from economic booms and United States results are anomalous to the majority of the world.

A 2009 Gallup survey in over 100 countries in showed that religion continues to play an important role in many people's lives. The global median proportion of adults who say religion is an important part of their daily lives is similar to what Gallup has found in other years. The 2009 survey confirmed that richer countries are generally less religious. The United States is one of the rich countries where this is not the case (Crabtree 2010). Blow (2010) used Gallup's data to chart religiosity against per capita GDP and grouped countries by their size and dominant religions. His chart, which can be seen in Figure 53, shows an American singularity as compared to most of the developed world.

Second, it should be considered that there is a component of Seventh-day Adventist theology that may be particularly demanding in economically threatening times – Sabbath observance. In short, it is rather non-negotiable. All commercial and economic matters are suspended from sundown Friday to sundown Saturday. Pastors do not

[64] Presumably rendering all economic matters irrelevant.

provide a special dispensation[65] for financial hardship and it would be considered breaking the Sabbath if a parishioner goes to work even if they attended church earlier in the day. This core belief[66] may compromise the church's ability to grow during economically threatening times.

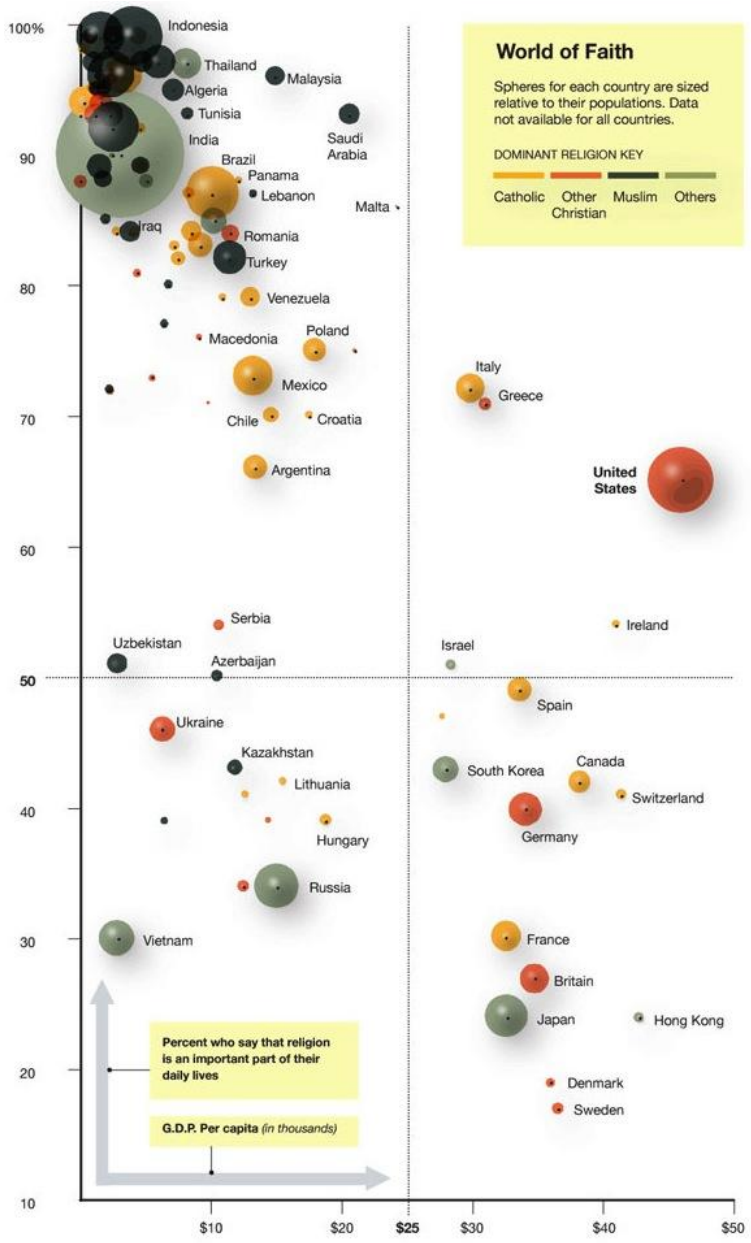

Figure 53. Gallup Religiosity Data and Per Capita GDP.

[65] Exceptions are often made for emergency personnel and medical professionals.
[66] Indeed, it is part of the name.

Conclusion

The relationship between religion and economic has been researched for decades and philosophized for centuries. This chapter added to this dialogue by providing an empirical look at the relationship between the business cycle and religiosity; specifically the Puerto Rican economic cycle and growth and giving in the Seventh-day Adventist church in Puerto Rico. The models estimated in this chapter show that macroeconomic factors and church growth and giving metrics are systematically related and suggestive of a casual relationship. These findings add to the economic model of religiosity pioneered by Azzi and Ehrenberg (1975) that investigated the links between changing macroeconomic conditions and religious participation.

The unexpected findings regarding macroeconomic variables and church growth suggest some additional research possibilities. A similar study in other regions (not just islands) would be illuminating and including other evangelical denominations would help determine if this trend is uniquely Adventist. Also, it might shed additional light to not just investigate conversions, but also church attendance. It could be that members that are casual attendees or have become estranged from their former church community return during economic threatening times. This increased religiosity would not be observable through increased baptisms or church membership, since these individuals are already on the church books.

Though Gallup might disagree (Gallup 2009), Ferguson (2009) states that, "Very often in times of financial crisis when banks fail and our trust in money diminishes, you'll see a religious revival." A view common to many religious leaders that believe that religiosity is influenced by the business cycle (Vitello 2008; Anderson 2009).

Recently, Lashinsky and Kowitt (2008) reported that St Bartholomew's Episcopal Church in New York City, had a 10% increase in attendance from the fall of 2007 to the fall of 2008. Using images from the Wall Street debacle as a draw, St. Bart's offered an eight-week refresher course on faith. Also in 2008, Trinity Church on Wall Street has tripled attendance at its lunchtime services from the summer to the fall. Weiss (2008) writes synagogue attendance in New York City has experienced a sudden jump - "For Temple Israel and several other synagogues in the New York metropolitan area, the latest crises on Wall Street have infiltrated their halls" (1). These reactions may help explain why economists have started to recognize that religion's role should be acknowledged to fully understand the workings of economic systems (Nelson 2001). Barro and McCleary (2002) write that economic growth analysis must include social factors such as religion, since appending economic attitudes and activities with beliefs, norms and values gives a more realistic picture of human behavior (Mangeloja 2003).

CHAPTER IV

SUMMARY

The dissertation added to the understanding regarding the relationship between religion and economic development. Facilitating a discussion that dates back at least to Thomas Aquinas, this three-article dissertation model provided an ideal approach towards expanding this literature. Through the lenses of Mundell's (1961) Optimal Currency Area framework, the Human Development Index and Azzi and Ehrenberg (1975), this dissertation investigated the intersections of Seventh-day Adventism and economic development in Puerto Rico.

Stemming from exchange rate regime debates after World War II, Mundell (1961) pioneered the theory of the Optimal Currency Area during a time when most countries fixed their currency to the U.S. Dollar, which was then convertible at a fixed rate into gold (Van 2004). Mundell implicitly defined an OCA as a currency area where the benefits of adopting a single currency outweigh the costs of relinquishing the exchange rate as an internal adjustment instrument (International Monetary Fund 1997). Comparing a nation's benefits and costs from participation in a currency union, his optimum currency area idea asked when is it beneficial to relinquish monetary sovereignty in favor of a common currency. The benefits are lower transaction costs, price stabilization, improved resource allocation efficiency, and increased access to markets. However, a country's loss of sovereignty as to national monetary and exchange rate policies can be a significant cost.

The United Nations Development Programme's (UNDP) Human Development Index (HDI) utilizes three components to measure economic development: income, longevity,

and education (United Nations Development Programme 2009a). Since 1990, the Human Development Reports have published the Human Development Index, a composite measure of human development, which has become one of the most widely discussed measures of the impact of economic development on well-being (Crafts 1997b). It was felt that a summary measure is needed to supplement gross domestic product (GDP) per capita (Fukuda-Parr 2001), thus the UNDP launched the Human Development Index as a measure of the level and standard of living in cross-country comparisons to accompany the usual measures of gross national product (GNP) or GDP, (Low and Aw 1997) which have traditionally had a singular influence on development economics. This is significant because while poverty can be alleviated at quite low-income levels, high average incomes do not automatically safeguard the general populace from poverty (Streeten 2000). Quality of life can vary greatly between countries with similar levels of per-capita GNP and real income (Anand and Sen 2000).

Azzi and Ehrenberg (1975) developed the first economic model of religiosity investigating the links between changing macroeconomic conditions and religious participation by focusing on church membership and the frequency of church attendance. Their model attempted to explain household allocation of time given to religious activities. It was the first systematic attempt to study participation in religious activities through the rational-choice approach to the demand for religion. It was the starting point for the most recent literature on the economic analysis of religion and pioneered the modern economics of religion (Iannaccone 1998; Ekelund, Hebert and Tollison 2002; Pita Barros and Garoupa 2002; McCleary and Barro 2006).

Also framing this research is the theory regarding threatening circumstances and authoritarian churches. Sales (1972) related contemporaneous economic threat to authoritarian behaviors by finding that difficult economic conditions increase conversion rates to authoritarian churches, while better economic times increase conversion rates to nonauthoritarian churches. In his work, Sales concentrated on eight Christian denominations, which he classified as authorization and nonauthoritarian as outlined below:

Authoritarian

- Church of Jesus Christ of Latter-day Saints
- Roman Catholic Church
- Seventh-day Adventist Church
- Southern Baptist Convention

Nonauthoritarian

- Congregational Christian Church
- Northern Baptist Convention
- Presbyterian Church in the United States of America
- Protestant Episcopal Church

Among the denominations outlined by Sales (1972), the Seventh-day Adventist and Latter-day Saints have comparable commitment expectations and hierarchal structures. They both have distinctive lifestyle doctrines, which include a call for members to tithe to the church along with further contributions to other church activities. Additionally, there is an expectation that members observe a weekly day of worship and rest, or Sabbath, which for Adventists are Saturdays and typically Sundays for Mormons (Campbell and Monson 2007; GCSDA 2010).

Building on the above-articulated categorizations, the denominations researched by Sales (1972) can be graphed as seen in Figure 54 along demand and hierarchy axes. The SDA and LDS churches are considered high in both demand and hierarchy, while most mainline Protestant denominations, low in both areas, would be positioned in the non-authoritarian quadrant. Thus studying the Seventh-day Adventist church focuses this research in the High-demand/High-hierarchy quadrant of authoritarian church classifications.

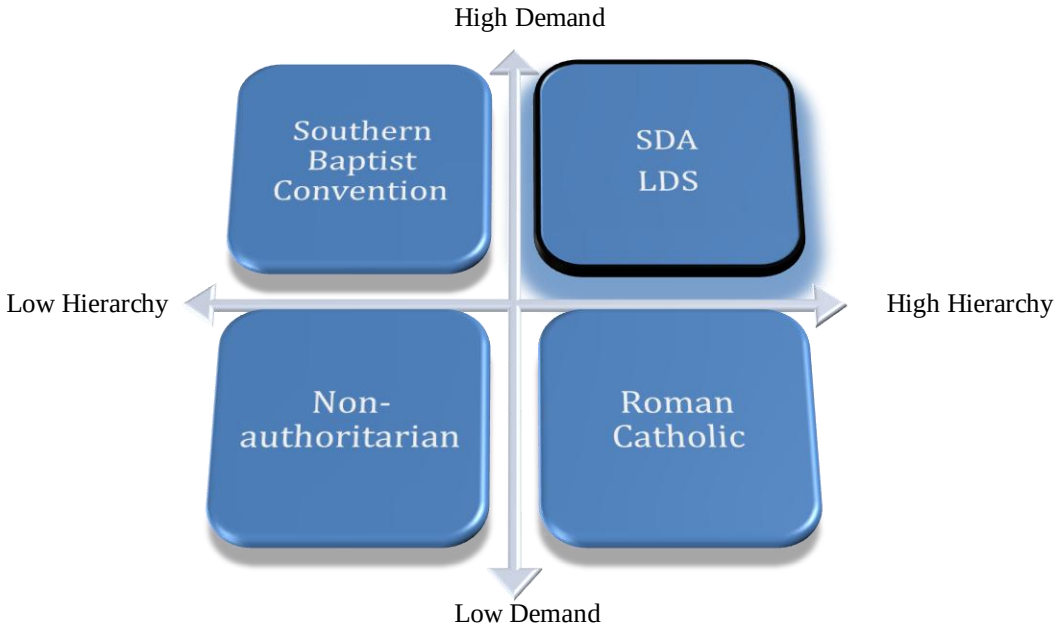

Figure 54. Authoritarian Denominational Classifications.

The hypothesis that threat is one cause of increased authoritarianism is an academic attraction for choosing to investigate the Seventh-day Adventist Church. There is a general acceptance of the link between social, political or economic threat and authoritarianism (Sales 1973; Altemeyer 1988; McCann and Stewin 1990; Simonton 1990; Doty et al. 1991; Peterson et al. 1993; Stone and Smith 1993). Threatening

circumstances lead to higher levels of attraction to authoritarianism (Fromm 1941; Rokeach 1960; Sanford 1966; Wilkinson 1972), with relatively authoritarian organizations becoming increasingly attractive.

The Seventh-day Adventist (SDA) has a global reach that presents an attractive research opportunity. Doctrines that may influence economic development, including an emphasis on healthful living along with organizations that promote educational attainment add to the appeal. Along with providing a central clearing house for church statistics such as membership, baptisms, tithe receipts and institutions, the centralized form of church governance used by the SDA church generally eases access to many individual congregations and institutions. The church's universally recognized (that is, among SDA members) 28 "Fundamental Beliefs" has developed a community around familiar values, perspectives, practices and beliefs (Durkheim 1912/2001; Gustafsson 1997; Henslin 2002), while suggesting a church-wide homogenization of beliefs.

In most religious movements, one person generally overshadows the landscape. In Seventh-day Adventism this person was, and through her writings continues to be, Ellen G. White (Martin 1997). According to SDA theology, she is considered the Lord's messenger and her writings are an authoritative source of truth (GCSDA 2010). Along with her husband, James and Joseph Bates, she was part of early Adventism's leading triumvate (Butler 1986) and she would become instrumental in the origins of this major American sect (Numbers 2008).

Along with White's deliberations on sabbatarianism, eschatology, health reform, temperance, medicine, child nurture, education and religious liberty, her writings include numerous economic observations. When writing about the benefits of country living over

city living, White wrote that the "sense of being owners of their own homes would inspire them with a strong desire for improvement ... their children would be educated to habits of industry and economy … they would feel that they are men, not slaves, and would be able to regain to a great degree their lost self-respect and moral independence" (White 1952, 373). Incapable of escaping Calvin, she wrote that "Religious duty and the highest human prudence in business lines must be co-mingled (381)" and "Obedience to God's law is the great incentive to industry, economy, truthfulness, and just dealing (489)." In counsel to businessmen she prompted them to do their business in a manner that would glorify God and to be diligent in their work (White 1888) and that a Christian's business is a part of his service to God (White 1903).

Studying the SDA church has other academic attractions. Bull (1989) contends, "Seventh-day Adventism is one of the most important religious movements native to the United States." Yet it receives scant scholarly attention. Also, Seventh-day Adventism is a "New World" faith that makes an interesting comparison to the "Old World" faith that is the backbone of the Puerto Rican culture – Roman Catholicism. This empirical juxtaposition makes for a potentially more interesting comparison than merely using another "Old World" Christian tradition.

This dissertation reflects the current literature in which researchers describe studies of economic attitudes and argue of religious beliefs and development being inextricably linked (White and Tiongco 1997). Swager (2000) writes that economic development must include a spiritual dimension (Figure 55), while Guiso, Sapienza and Zingales (2003, 1) found that "on average, religious beliefs are associated with 'good' economic attitudes, where 'good' is defined as conducive to higher per capita income and growth" and "that

[overall] Christian religions are more positively associated with attitudes conducive to economic growth." This finding is similar to Barro and McCleary's (2003, 779), where they found "causal influences from religion to economic growth" and that "stronger religious beliefs stimulate growth because they help sustain specific individuals that enhance productivity." McCleary (2007, 50) goes as far as to argue that "religion contributes to economic growth by providing people with … beliefs" that are conducive to positive economic outcomes. Most recently, Traunmuller (2009) found evidence of a double positive effect of Protestantism, where Protestants tend to be more trusting and that a Protestant context increases trust, regardless of individual religious belief.

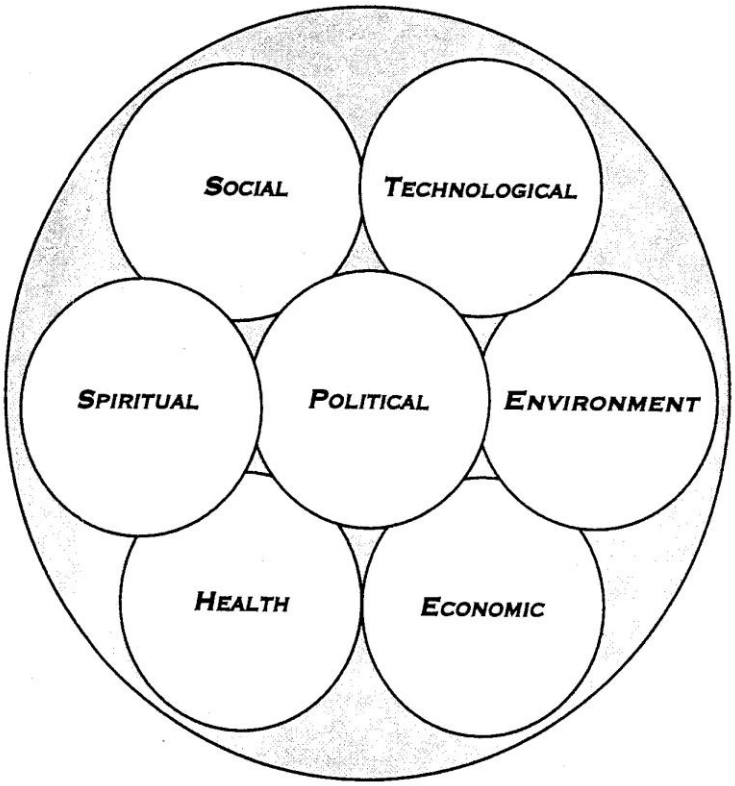

Figure 55. Dimension of Economic Development (Swager 2000).

With its themes of the universal common good and global civil society, Thomas Aquinas' *De Regno (De Regimine Principum) ad Regem Cypri* (1267) and *Summa*

Theologica (1265–72), where Aquinas argued for the Christian commitment to progress (Stark 2005), were antecedents to the economic concern with religion and development. Adam Smith, in *Theory of Moral Sentiments* (1759), wrote that religious beliefs provide strong incentives for individuals to follow moral structures – structures that often support economic growth. He wrote that our conscience is something innate and that people are born with a moral sense that is not provided by laws or by rationality. This same "invisible hand," Smith would argue, also creates beneficial social patterns out of our economic actions. Smith extended economic reasoning to an analysis of religious behavior in his *Wealth of Nations* (1776).

Later Max Weber's *Die protestantische Ethik und der Geist des Kapitalismus* (1904) theorized that religion may be a significant positive or negative force on economic development. Weber argued that the Protestant Reformation paved the way for modern capitalism by highlighting the value of individual responsibility, personal diligence, approved risk-taking and financial self-improvement. The rise of capitalism, according to Weber, was a cultural trend rooted in religion. Heaven and salvation, hell and damnation and other supernatural rewards are great motivators of behavior in this world (McCleary and Barro 2006). Thus a key principle in the Weberian ethos is that religious beliefs, though not necessarily participation in organized religion, are critical for economic outcomes. Weber viewed religiosity as an independent variable capable of influencing economic results (McCleary 2007) by promoting work ethic, honesty, trust and thrift. He focused on the path leading from medieval Catholicism, through Lutheranism, to Calvinism.

With the principal forms of Protestantism descending from his ideas, John Calvin was vital to the Protestant Reformation zeitgeist (Bellouc 1928; Tawney 1952; Hooker 1999). A pressing disquiet to obtain reassurance of Providence's inscrutable judgment favoring the individual shaped Calvinist conduct. Rather than being characterized by passive acknowledgment of fate, Calvinism meant an arduous and prolonged effort as a dutiful instrument of God's will. Striving for maximum returns on assets and abstaining from immediate gratification from the fruits of their business activity, Calvinists considered themselves morally bound to maintain business success through "relentless, steady, and systematic activity" (Peet 1999, 70).

Historically positioned in the early stages of modern economic development, Calvin reflected on the Genesis account regarding human origins and noted that the Lord placed all of creation, including its wealth, in man's care, thus assigning human stewardship to economic matters. The Biblical archetype of *imagodei* (created in God's image) found in Genesis 1 suggests that man is capable of creating, allowing man to utilize God's abundance towards growing wealth. Along with this abundance came responsibility and a mandate for wise stewardship, which could help explain why for centuries after the Reformer's death wealth development occurred wherever Calvinists made their homes (Hall and Burton 2009). Calvinist thought also provided a theological basis for private property, largely missing in other cultures (Stark 2005) and the doctrines of thrift and hard work later influenced Adam Smith (Skousen 2006).

A primary precept of Calvinism sought to inculcate religion into all areas of life and any area of work, including business, could be a calling from God; as valid and sacred as clergy. Calvinism taught that God values all work and is a part of His providential

calling (Stark 2005; Hall and Burton 2009) thus liberating economic energy (Tawney 1952) and paving the way for modern, market-based business practices. With few theologians connecting economic philosophy with the divine quite this way, this new commercial tradition is among Calvinism's most enduring contributions (Bieler 1959; Hall and Burton 2009).

The making of a new man – rational, ordered, diligent and productive – was at the core of the Protestant work ethic. Protestantism promoted these traits among its adherents and often judged others through these standards. Literacy instruction for both girls and boys is a prime example of this philosophy. This was product of Bible reading, since good Protestants are expected to read the Scriptures for themselves, and resulted in widespread and continued literacy (Landes 2000).

Religion can be delicate to investigate since it can be politically, emotionally and culturally charged. It can also be intellectually messy with its attendant definition and measurement problems. Cause-and-effect relationships between religion and other variables like policies, institutions and economic development run in both directions (Harrison 2000). As illustrated in Figure 56, this broad analysis from macroeconomic variables to regional economic variables and regional church statistics to individual member attitudes employed religion as both dependent and independent variable.

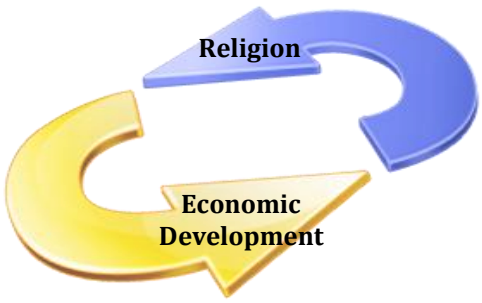

Figure 56. Two-way Relationship Between Variables.

There are several academic attractions in choosing Puerto Rico as the geographical area under study. As an island it possesses an isolation that provides a natural research laboratory and is one of the most dynamic and open economies in the Caribbean region (Collins, Bosworth and Soto-Class 2006; Vega-Rosado 2006). Puerto Rican economic development invites investigation from United States economists (Baumol and Wolff 1996) and is a case of legitimate interest to development scholarship (Padin 2003). Baumol and Wolff (1996) placed Puerto Rico in an international context and argued that the Puerto Rican experience held valuable lessons for emerging economies. Sotomayor (2004) writes that Puerto Rico represents one of the earliest examples of development through integration to the world economy, thus should be of special interest.

Particularly relevant to this dissertation are the cultural and historical factors that make Puerto Rican an interesting case in regards to the intersections of religion and economics. With their four hundred year shared history, language and religion, Spanish culture dominates Puerto Rican behavior (Spillan, Parnell and Singh 2007). The Roman Catholic faith was exported to Puerto Rico with the 16th century conquest and became a Roman Catholic colony. That experience produced cultural traditions penetrated by the Catholic faith. Thus religion, specifically Roman Catholicism, became the cultural support that came out of that historical background. Not unlike other countries founded by the Spanish empire, the religious values of the community are "deeply imbedded in the culture" and "it played a significant role in symbolizing the central values of the society" (Fitzpatrick 1987, 36).

Chapter II entitled "From The Fed to *La Fortaleza* – The Effects of United States Monetary Policy Shocks on Puerto Rican Employment" asked how the United States

monetary shocks affect Puerto Rican employment. A recurring macroeconomic theme is the power of monetary policy to influence economic activity. This chapter examined the impact of United States monetary policy on employment figures in Puerto Rico. In small, open and dollarized economies, like Puerto Rico's, it's necessary to consider outside influences. Given the high level of connection between the United States and Puerto Rican economies and the island's lack of an autonomous economic policy, this proves to be particularly pressing. Because of this close integration between the United States and Puerto Rico, fluctuations in U.S. economic variables are easily transferred to the Puerto Rican economy and help determine both long- and short-term performance of the Puerto Rican economy (Alameda 2000, 2006). Yet, there is relatively limited research assessing the effects of U.S. monetary policy on the Puerto Rican economy (Kicinski 2007).

"From the Fed" added to the conversation by assessing the asymmetric effects of U.S. monetary policy on Puerto Rico. As compared to other works studying the effects of U.S. monetary policy and Puerto Rico, one of the innovations of this research is the use of actual jobs lost or gained, rather than employment rates and percentages. Another difference is the inclusion of various U.S. economic variables in the VAR model. However, the main distinction is that while these studies on Puerto Rico investigate the effect of monetary policy shocks in general, this chapter investigated a more narrow question: Does the impact of U.S. monetary policy shocks shed any insight as to whether Puerto Rico belongs in the dollar union?

Chapter II used a vector autoregression model to track how unexpected changes to monetary policy—as measured by the federal funds rate—impacts the Puerto Rican economy. There are two types of Vector Auto Regression: reduced form and structural.

The reduced form model is what gets estimated and is turned into a structural model by imposing theoretical restrictions. These restrictions help identify "structural shocks," in this case the monetary policy shock. In this study, two sets of identifying restrictions were applied. First, recursive restrictions were applied such that the federal funds rate can respond to, but not affect, the other macroeconomic variables contemporaneously. This restriction is consistent with standard macroeconomic theory, which says that monetary policy can only affect the real economy with a lag. Second, restrictions were imposed such that the Puerto Rican economy can be affected by the U.S. economy but not vice versa. This latter restriction is based on the notion that is Puerto Rico is "too small to matter" in regards to influencing the general U.S. economy and provides realistic restrictions on the relationship between the U.S. and the Puerto Rican economy.

As the Puerto Rican business cycle generally follows that of the United States (Bram, Martinez and Steindel 2008) it is not unexpected that U.S. monetary policy shocks generate asymmetric effects in Puerto Rico (Toledo 1996). However, that the Puerto Rican employment response to such shocks is significantly worse than the United States, the U.S. Virgin Islands and Hawaii makes for an interesting discovery. This echoes Alameda's (1998) finding that the Puerto Rican economy is more sensitive to U.S. monetary policy shocks the United States itself.

Table 29 highlights the significant difference between the Puerto Rican response to the shocks and those of the other territories in the VAR model. Figure 57 illustrates how the Puerto Rican employment response to U.S. monetary policy shocks is statistically significantly.

Table 29

Puerto Rico Results as Compared to other Territories

Months After Shock	Hawaii	Virgin Islands	United States
6	1258%	37%	302%
12	173%	10%	171%
18	120%	30%	153%
24	88%	49%	145%
30	58%	61%	153%
36	33%	60%	179%

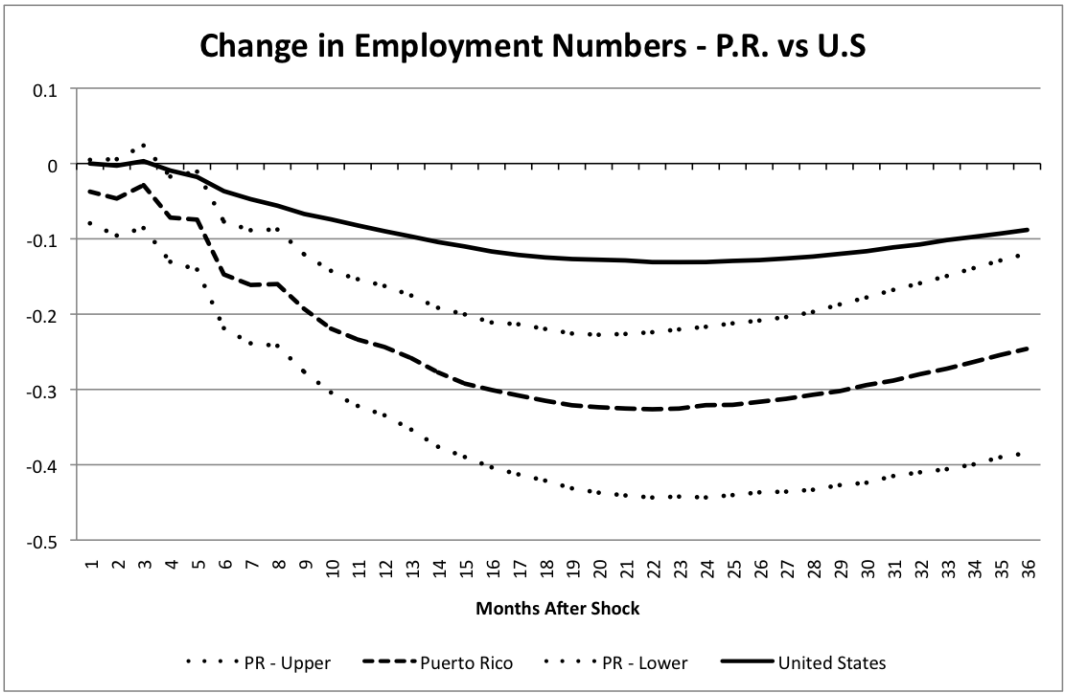

Figure 57. Impulse Response Function – Puerto Rico and the United States.

To contribute to understanding the impact that U.S. monetary policy has on small, dollarized economies some further empirical work would be ideal. Unites States monetary policy shocks clearly have both long term and short-term effects on the Puerto Rican economy, with a major affect on employment numbers. But, why does this happen? Is it a lack of a diversified economy? Does a required federal minimum wage level like the mainland United States limit employment opportunities? Is it the low

percentage of private enterprise or the high transfer payments? How does Puerto Rico's low employment-to-population ratio influence these results? Why does Puerto Rico have a worse reaction than the Virgin Islands, which is only 90 miles away and likewise closely tied to American economic fortunes? These are just a few recommendations for further research.

Some policy questions can include - What other factors are influencing the Puerto Rico employment data? What can be some rational expectations of U.S. monetary policy? What should policy makers in San Juan and Washington D.C. consider upon the onset of monetary policy shocks?

Puerto Rican employment, GDP, inflation, interest rates, consumer spending, investments and trade are all influenced by the United States Federal Reserve Bank's monetary policy actions. Any discussion regarding the Puerto Rican economy needs to take into account the Island's relationship with the United States and the dollarized status of the Puerto Rican economy (Kicinski 2007). Also, with the continued primacy of the U.S. dollar in the Americas and the regional economic integration initiated with NAFTA, the study of United States monetary policy is integral to an understanding of Caribbean and Latin American economies.

Chapter III, entitled "*AVANCE* Study Findings –Perceived economic development benefits from Seventh-day Adventism in Puerto Rico," is built upon a large study of the SDA church, *AVANCE: A Vision for a New Mañana* by Ramírez-Johnson and Hernández (2003). Conducted as follow-up to the Valuegenesis study (Dudley and Gillespie 1992; Rice and Gillespie 1992), *AVANCE* focused on the SDA Hispanic Community in North America. *AVANCE* investigated what variables affect the relationship between Adventist

homes, schools, and churches and Hispanic youth and adult's commitment to the Christian faith.

The survey results showed promise as a tool to evaluate economic development among the members of the SDA church in Western Puerto Rico. These types of questions help evaluate how members of the SDA church identify economic benefits from converting to Seventh-day Adventism. This chapter took a closer and more detailed investigation at SDA membership and its influence on the economic development of its members in Puerto Rico. Since purpose of this research is to investigate what perceived influence the SDA church has had on the development of those members in the island where the SDA church has been active, the three variables outlined by the HDI provided the variables to be measured.

The regression models suggest that of the variables measured, only commitment level has any significant affect on perceived economic development. Specifically, for the Standard of Living Index, Age, Income and Commitment Index have a statistically significant positive relationship. For the Development Index, Education Level and Commitment Index have a statistically significant positive relationship. For the Health Index and the Education Index only the Commitment Index had a statistically significant positive relationship. Finally, for the Commitment Index, none of the independent variables are statistically significant.

Gender and previous religious affiliation have no effect, with education level, age and income level having minimal to negligible effect. These findings show that commitment level, or religiosity, and reported economic development are systematically related and are suggestive of a casual relationship. This is not unexpected given the similar

conclusions regarding the influence of religiosity on economic outcomes (White and Tiongco 1997; Garner 1998; Guisoa, Sapienza and Zingales 2003; Barro and McCleary 2003; McCleary and Barro 2006; Khan and Bashar 2008) and that the "patterns and practices of religious institutions are among the most important influences on people's lives" (Andersen and Taylor 2007, 337). Nevertheless, there are some additional research opportunities that could add to the conversation regarding the intersections of religion and economic development.

A follow-up investigation may include investigating if members are more committed because they are doing better economically or are they doing better economically because they are committed. Another approach might include expanding the survey to a wider membership sample. The methodology was biased towards those that attend meetings above and beyond the traditional weekly gathering, a priori suggesting a higher commitment level. Presumably, this higher level brings with it increased educational achievement, a more holistic health approach, social capital and other benefits often attendant of religiosity.

Along with providing answers to questions of ultimate meaning, religion establishes values, moral proscriptions and behavioral norms (Furseth and Repstad 2006; Andersen and Taylor 2007). Through these norms and values, religion influences behavior (Bock, Cochran and Beeghley 1987) with conservative denominations, like the SDA church, producing particularly strong behavioral influences (Gay and Ellison 1993; Wellman 1999).

Chapter IV, entitled "Faith and Figures in *La Isla del Encanto* – The Effects of the Puerto Rican economy on Seventh-day Adventist Church Growth and Giving," completes

the research on religion and economic development by combining the elements elucidated in the previous two chapters (Figure 58). Using macro-economic data from Puerto Rico and growth and giving metrics from the Seventh-day Adventist Churches in Puerto Rico it added to the conversation on the potential links between religion and economic development. This chapter asked how does the Puerto Rican economy impact growth and giving in the Seventh-day Adventist church in Puerto Rico.

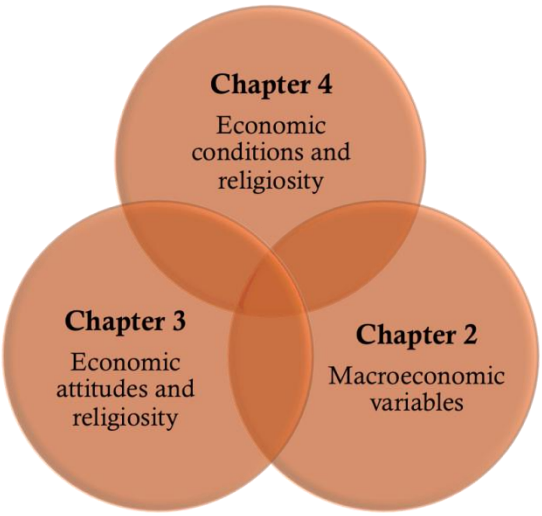

Figure 58. Elements of This research.

Correlation and basic regression analysis were employed to examine the associations between Puerto Rican, Jamaican and Hawaiian macro-economic indicators and SDA church growth and giving metrics. To make quantitative measurements of this potential relationship, basic regressions were run using current and lagged macroeconomic variables. The regression analysis determined which independent variables had a statistically significant influence on the dependent variables. These models were used to determine which independent variables would be utilized in a multivariate regression analysis.

It was expected that changes in Seventh-day Adventist tithing should closely mirror macroeconomic changes and indeed that is what the models suggest. In all three areas under study, at least one economic indicator had a significant effect on SDA tithing. Often this effect was contemporaneous. This is not surprising, given that tithing is a function of income and it stands to reason that economic factors would directly impact giving.

With the Adventist church classified as authoritarian, it was expected that changes in SDA membership and baptisms would reflect economic-driven changes in religious participation. Specifically, that membership and baptisms in the SDA church would be countercyclical; economy goes down, membership and baptisms go up. That is not what this chapter's models describe. Instead, the models suggest a procyclical reaction to macroeconomic conditions in Puerto Rico.

Two possible explanations are presented. First, the traditional results regarding the countercyclical and procyclical properties of denominations are drawn from the United States. What if it is different for evangelicals in developing economies? In his research of Adventist missionary efforts, Lawson (1998) found that new Adventists have experienced widespread economic advancement and that recent proselytes were often drawn to Adventism because it is believed to offer development opportunities; this despite that a principal Adventist doctrine is the imminent return of Jesus Christ and its attendant ending of the world. Because of Adventism's tendency to make education a keystone of their evangelization (Lewellen 1979) and give a high priority to developing schools, new members are attracted to the upward mobility often afforded by a formal education (Stoll 1990; Lawson 1998). As a result of missionary efforts, it is often

evangelical Protestants that are upwardly mobile in developing economies. Thus, it could be that, in emerging economies, evangelical Protestant churches benefit most from economic booms?

Second, it should be considered that there is a component of Seventh-day Adventist theology that may be particularly demanding in economically threatening times – Sabbath observance. In SDA orthodoxy, this doctrine is non-negotiable. All commercial and economic matters are suspended from sundown Friday to sundown Saturday. Pastors do not provide a special dispensation for financial hardship and it would be considered breaking the Sabbath if a parishioner goes to work even if they attended church earlier in the day. This core belief may compromise the church's ability to grow during economically threatening times.

Though Gallup might disagree (Gallup 2009), Ferguson (2009) states that "Very often in times of financial crisis when banks fail and our trust in money diminishes, you'll see a religious revival" (n.p.). A view common to many religious leaders that believe that religiosity is influenced by the business cycle (Vitello 2008; Anderson 2009). While this may not always be the case, economic analysis must include social factors such as religion, (Barro and McCleary 2002) since appending economic attitudes and activities with beliefs, norms and values gives a more realistic picture of human behavior (Mangeloja 2003).

Religion's role in the public discourse is increasingly recognized (Steensland et al. 2000). Whether through symbols, pedagogy, rituals, preaching or discussion, religions shape member's concrete views on a wide range of social issues, including economic, (Wald, Owen and Hill 1988; Welch et al. 1993) in ways that often transcend social class,

educational attainment, or other sociological factors (Leege and Kellstedt 1993; Davis and Robinson 1996; DiMaggio, Evans and Bryson 1996; Green, Guth and Smidt 1996; Wald and Calhoun-Brown 2007). There is sufficient rationale for development theorists and economists to accept religion's role on economic systems and its relevance on economic development (Nelson 2001; Barro and McCleary 2003; Mangeloja 2005; McCleary and Barro 2006).

Most accounts of our relationship to God convey suggestions for how we should live our lives (Sandel 2005); suggestions that often include economic concerns. While there is no consensus on the exact causal relationship between religion and economic development, most empirical studies point to a positive relationship (Khan and Bashar 2008). This can be because religion often promotes honesty, hard work, education and other activities that often produce positive economic outcomes, meanwhile discouraging activities that often produce negative economic outcomes. Religion is a way of making sense of our relation to God and of determining how to appropriately approach that relationship (Hartman 1985). Through these approaches, religion can reinforce productive, or unproductive, economic traditions (Porter 2000).

APPENDIX A

AVANCE QUESTIONS

Q1: I help others with their religious question and struggles.

Q2: I seek out opportunities to help me grow spiritually.

Q3: I feel a deep sense of responsibility for reducing pain and suffering in the world.

Q4: I give significant portions of time and money to help other people.

Q5: I feel God's presence in my relationships with other people.

Q6: My life is filled with meaning and purpose.

Q7: I care a great deal about reducing poverty in my country.

Q8: I try to apply my faith to political and social issues.

Q9: My life is committed to Jesus Christ.

Q10: I talk with other people about my faith.

Q11: I have a real sense that God is guiding me.

Q12: I am spiritually moved by the beauty of God's creation.

Q13: Are you male of female?

Q14: If you had a birthday party and invited your 5 best friends (excluding relatives), how many would be people who are Adventist?

Q15: What type of school are you attending?

Q16a (You): Indicate the *highest* level of education completed by each person.

Q16b (You mother): Indicate the *highest* level of education completed by each person.

Q16c (Your father): Indicate the *highest* level of education completed by each person.

Q17: How many years of Adventist education have you had?

Q18: Who was the first person in your family to attend college?

Q19: How acquainted are you with the following Adventist colleges and universities?

A. Andrews University

B. Atlantic Union College

C. Canadian Union College

D. Columbia Union College

E. La Sierra University

F. Loma Linda University

G. Oakwood College

H. Pacific Union College

I. Southern College

J. Southwestern SDA College

K. Union College

L. Walla Walla College

How often have you done each of the following during the last twelve months?

Q20: Tried directly to encourage someone to believe in Jesus Christ.

Q21: Told others about the work of God in your life.

Q22: Tried directly to encourage someone to join the Adventist church.

How often do you do each of the following?

Q23: Pray or meditate, other than at church or before meals.

Q24: Watch religious programs on television or listen to religious radio programs.

Q25: Read the Bible on my own.

Q26: Read the writings of Ellen White.

Q27: Read religious magazines, newspapers, or books.

Q28: The authority of the writings of Ellen White for SDA's today should be:

Q29: Overall, how meaningful is the Sabbath in your life? Mark only one.

Q30: How well do you support the church financially?

For each of the following statements, tell how much you agree or disagree. Mark only ONE answer.

Q31: I know that to be saved I have to live by God's rules.

Q32: I know that God loves me no matter what I do.

Q33: There is nothing I can do to earn salvation.

Q34: The more I follow Adventist standards and practices, the more likely it is that I will be saved.

Q35: The way to be accepted by God is to try sincerely to live a good life.

Q36: The main emphasis of the gospel is on God's rules for right living.

Q37: I am loved by God even when I sin.

Q38: More should be done to have women in key leadership positions in the local Conference, Union, and Division.

Q39: Men should have equal responsibility for taking care of house chores.

Q40: Our church is involved with the community around the church.

Q41: Personal success is a sign of God's blessings.

In your opinion, how right or wrong are each of these? Mark only one answer.

Q42: Efforts by one racial group to keep people of another race from moving into their neighborhood.

Q43: A company paying women employees less than men employees for similar work.

Q44: Passing laws to make it illegal to discriminate against women and minorities.

Q45: Encourage individual church members to support local social reforms to relieve poverty and hunger.

Q46: Abortion when a doctor says the baby is likely to be born with a serious handicap.

Q47: Sexual intercourse by two unmarried persons who love each other.

Q48: What is your understanding of the role that men and women should have in the home? Mark only one answer.

Q49: What is your understanding of the role that women should have in the church? Mark all that apply?

1. Women can only serve in non-ordained leadership positions in the church (deaconesses, Sabbath school teachers, etc.).
2. Women can serve as ordained elders.
3. Women can serve as non-ordained pastors.
4. Women can serve as pastors.

How strongly do you believe each of the following statements? Mark only ONE answer.

Q50: God created the world in six 24-hour days.

Q51: Jesus will come back to earth again and take the righteous to heaven.

Q52: The Ten Commandments still apply to us today.

Q53: The true Sabbath is the seventh day – Saturday.

Q54: The investigative or pre-advent judgment in heaven began in 1844.

Q55: When people die, they remain in the grave until the resurrection.

Q56: The wicked will not burn forever but will be totally destroyed.

Q57: Ellen G White fulfilled Bible predictions that God would speak through the gift of prophecy in the last days.

Q58: The 7th-day Adventist Church is God's true last-day church with a message to prepare the world for the second coming of Christ.

Q59: The body is the temple of the Holy Spirit and we are responsible in every area of life for its care.

Q60: At what age did you join the 7th Day Adventist church (through baptism or profession of faith)?

Q61: Where were you baptized? Mark only ONE.

Think about the local church you attend. How much do you agree or disagree with each of these statements?

Q62: Programs at my church are interesting.

Q63: Programs at my church make me think.

Q64: My teachers or adult leaders know me very well.

Q65: I am proud of being a 7th Day Adventist.

Q66: The leaders at my church are warm and friendly toward the youth.

Q67: I don't participate in church programs because I don't speak Spanish well.

Q68: I look forward to going to church.

Q69: I have been put down because I don't speak good Spanish.

Q70: I go to church because I want to.

Q71: I would like to serve the church in some capacity as a denominational employee in the future.

Q72: It encourages me to ask questions.

Q73: The church should provide bilingual programs (Sabbath school classes, sermons) for those Latinos who don't understand Spanish.

Q74: An important part of the mission of the Latino church is to preserve and promote Latino language and culture.

Q75: How do you describe yourself?

Q76: What is your sexual preference?

Q77: How old are you?

For each of these, indicate how important the goal is for you.

Q78: To spend time helping people.

Q79: To live my life according to Adventist standards.

Q80: To help people who are poor or hungry.

Q81: To have lots of money.

Q82: To be active in the Adventist Church.

Q83: To use my skills to help others have a better life.

Q84: To show love to other people.

Q85: To help promote social equality.

Q86: How often do you attend church?

Q87: Is your spouse a 7th Day Adventist?

Q88: Are or were your parents 7th Day Adventists?

Q89: Overall, how important is religion in your life? Mark only one answer.

How much have each of the following helped you develop your religious faith? Choose from these answers:

Q90: Pastor.

Q91: Church worship.

Q92: Sabbath school program and classes.

Q93: A close friend.

Q94: Community outreach programs.

Q95: Youth meetings.

Q96: Personal prayer and Bible study.

Q97: Evangelistic or revival meetings.

Q98: Adventist education.

Q99: About how much money did your family or household earn last year?

Q100: Which of the following best applies to you?

Q101: In general, what language do you read and speak?

Q102: In which language do you usually think?

Q103: What language do you usually speak at home?

Q104: What language do you usually speak with your friends?

Q105a (Yourself): Were each of the following people born in the United States?

Q105b (Your mother): Were each of the following people born in the United States?

Q105c (Your father): Were each of the following people born in the United States?

Q105d (At least one of your grandparents): Were each of the following people born in the United States?

Q106: How long have you lived in the United States?

Q107: How many times have you moved in the last 5 years? (Not counting vacations or brief trips)

As an Adventist, how much do you agree or disagree with the following practices?

Q108: Smoke or chew tobacco.

Q109: Drink alcohol (beer, liquor, wine, etc.).

Q110: Wearing jewelry (chains, rings, earrings, etc.).

Q111: Listening to rock music.

Q112: Dancing.

Q113: Attending movie theaters.

Q114: Using illegal drugs (marijuana, cocaine, etc.).

Q115: Having sex only in marriage.

Q116: Eating “unclean” meats.

Q117: Being vegetarian.

Q118: Observing the Sabbath.

Q119: Wearing modest clothes.

Q120: Engaging in competitive sports.

Q121: Exercising daily.

Q122: Wearing a wedding ring.

Q123: Wearing make-up.

Q124: Using drinks that contain caffeine.

Q125: Masturbating.

Q126: One should not use tobacco.

Q127: One should not drink beer or liquor.

Q128: One should not wear jewelry (chains, rings, earrings, etc.).

Q129: One should not listen to rock music.

Q130: One should not dance.

Q131: One should not attend movie theaters.

Q132: One should not use illegal drugs.

Q133: Sex should only occur in marriage.

Q134: One should not eat “unclean” meats.

Q135: One should be a vegetarian.

Q136: One should observe the Sabbath.

Q137: One should wear modest clothes.

Q138: One should not engage in competitive sports.

Q139: One should exercise daily.

Q140: Married persons should not wear a wedding ring.

Q141: One should not wear make-up.

Q142: One should not use drinks that contain caffeine.

Q143: One should not masturbate.

Q144: Drink alcohol (beer, liquor, wine, etc.).

Q145: Smoke or chew tobacco.

Q146: Wear jewelry (chains, rings, earrings, etc.).

Q147: Listen to rock music.

Q148: Dancing.

Q149: Use an illegal drug (marijuana, cocaine, etc.).

Q150: Watch TV or videos in your home.

Q151: Eat meat.

Q152: Have five alcoholic drinks or more in a row.

Q153: See a movie at a movie theater.

Q154: Go to a party where people were drinking.

Q155: Take something from a store without paying for it.

Q156: Watch sexually explicit videos or magazines.

Q157: Drink caffeinated drinks (cola, coffee).

Q158: Have premarital sex or sex outside of marriage.

Q159: Attend Friday night or Saturday secular activities.

Q160: Adventist schools provide a better education than public schools.

Q161: The church should seek for ways to make Christian Education affordable to all its members.

Q162: The spiritual value of Adventist school justifies the cost.

Q163: Latino pastors need to receive training in the social urban problems in the United States.

Q164: Latino pastors in the United States would be more effective if they were completely bilingual.

Q165: Have you ever experienced verbal or emotional abuse? If you have experienced verbal or emotional abuse, by whom?

Parents –

Spouse –

Close relative –

Friend or neighbor –

Other –

Q166: Have you ever experienced physical abuse? If you have experienced physical abuse, by whom?

Parents –

Spouse –

Close relative –

Friend or neighbor –

Other –

Q167: Have you ever experienced sexual abuse? If you have experienced sexual abuse, by whom?

Parents –

Spouse –

Close relative –

Friend or neighbor –

Other –

Q168: I feel proud of being a Latino.

Q169: I feel that to be white is more beautiful than being black or brown.

Q170: I will probably marry a Latino person.

Q171: When filling out a questionnaire, I identify myself as a Latino.

Q172: When I am able to, I am planning on changing my Latino name to an Anglo name.

Q173: Within the last year, I have read something dealing with my Latino heritage.

Q174: I would rather listen to American pop music than Latino pop music.

Q175: I feel proud of the color of my skin.

Q176: I get embarrassed when I have to introduce my family to my friends.

Q177: I feel that Latino culture has a lot to offer to the American culture.

Q178: In the last twelve months, have you ever tried to kill yourself.

Q179: How religious are your best friends?

Q180: Which of the following is the best description of your concept of salvation? Mark only one.

Q181: Before becoming an Adventist, with what denomination were you affiliated?

Q182: What was your very first contact with the SDA church? Choose only one answer

Q183: What was the main reason that most attracted you to the Adventist message? Mark the two main reasons.

Does not apply – I was raised Adventist

Family (spouse, children)

SDA church was warm and caring

Established close SDA friends

Church member came to my need

Truth and beauty of SDA message

Close personal friend

Understood the plan of salvation like never before

The SDA message provided a clear picture of the final world events

Health message

Charisma of minister/evangelist

Other

Q184: What are the last four digits of your home phone number?

Q185a (male): How many of your children are male or female?

Q185b (female): How many of your children are male or female?

Q186: In which month do your children have birthdays?

How often do you or your spouse do each of the following activities?

Q187: Talk with your children about your faith in God.

Q188: Pray with your children (other than before meals).

Q189: Discuss religious topics or issues with your children.

Q190: Talk with your children about what he or she is thinking or feeling about God.

Q191: Talk with children about their school work.

Q192: Help your children with their homework.

Q193: Spend time listening to your children's concerns.

Do you ever worry?

Q194: That your children will marry a non-Latino.

Q195: That your children will forget their Spanish.

Q196: That your children will forget and not appreciate their Latino cultural roots.

Q197: That your children might leave the church.

Q198: That your children will drop out of high school.

How often do your or your spouse do each of the following experience?

Q199: Had a good conversation with your children about sexual related topics.

Q200: Teach your children about your cultural background.

Q201: Read to your children in English.

Q202: Actively seek to teach Spanish to your children.

Q203: Talk with your children about their experiences in school.

Q204: Talk with your children about their educational plans after high school.

Q205: Take part in parent-teacher conferences.

Q206: Visit your children's classes.

Q207: Attend a school event such as a play, concert, gym exhibit, sports competition, honor ceremony or science fair.

Q208: Do volunteer work for the school such as supervising lunch or chaperoning a field trip.

Does your family enforce rules for your children about any of the following activities?

Q209: Maintaining a certain grade average.

Q210: Doing school homework.

Q211: Doing household chores.

Q212: Regular reading time.

Q213: Limit TV viewing.

Q214a (Adventist school): Indicate the type of school that each of your children attend. Give the number of children per school.

Q214b (Private religious school, but not Adventist): Indicate the type of school that each of your children attend. Give the number of children per school.

Q214c (Private school, not religious): Indicate the type of school that each of your children attend. Give the number of children per school.

Q214d (Public school): Indicate the type of school that each of your children attend. Give the number of children per school.

Q214e (Home school): Indicate the type of school that each of your children attend. Give the number of children per school.

Q214f (Number of children not in school): Indicate the type of school that each of your children attend. Give the number of children per school.

Q215: In your family, who chose the school your children attend? Mark only one.

In choosing the school your children attend, how important was each of the following factors?

Q216: Quality of the teachers.

Q217: Quality of the educational program.

Q218: Religious emphasis of the school.

Q219: Discipline of the school.

Q220: Financial cost.

Q221: Bilingual/English as a Second Language (ESL) program.

Q222: Location of the school.

Q223: Children's special needs and interests.

Q224: Availability of vocational-technical training.

Q225: Availability of work-study programs.

Q226: Multicultural education.

For each of the following statements, tell how much you agree or disagree

Q227: To acquire an Adventist education is an important goal for our family.

Q228: Sending our children to an Adventist school is simply too expensive.

Q229: The nearest Adventist school is too far away for me to send my children there.

Q230: The faster my children learn English and forget their Spanish, the more successful they will be in school.

Q231: Christian education is often promoted in our local congregation.

Q232: Adventist schools that are predominately Latino should provide bilingual or English education as a Second Language education.

Q233: In order for Latinos to be successful in the U.S., it would be best to distance themselves from their cultural roots.

Q234: How far in school do you want your children to go? Mark only one.

Q235: If your children go to college, how important is it to you that he or she go to an Adventist college or university?

Q236: How likely is it that your children will go to an Adventist college or university?

Think about the local Adventist elementary school or high school in your area. How much would you agree or disagree with the following statements?

Q237: The school makes an effort to recruit Latino students.

Q238: My local church is strong in its financial support for Adventist schools.

Q239: The school makes an effort to recruit Latino teachers.

Q240: The school makes an effort to help Latinos stay in school.

Q241: The teachers and principals are concerned about the unique needs and interests of Latinos.

Q242: The school helps its teachers to understand the needs and interests of Latinos.

Q243: The teachers understand Latino culture.

Think about the local Adventist elementary school or high school in your area. How much would your agree or disagree with the following statements?

Q245: The school understands the needs of those whose first language is Spanish?

Q246: The school curriculum reflects the unique needs of Latino students.

Q247: How would you describe your political affiliation in the U.S.?

Q248: For what presidential candidate did you vote for in the last election in the U.S.?

Q249: How would you describe your political orientation?

Q250: How long have you been a baptized member of the Adventist Church?

Think about your local congregation. Do the following statements describe your congregation? To what extent do you disagree or agree with the following statements?

Q251: My congregation thinks of itself as a close-knit family.

Q252: There have been times when members have been treated or judged unfairly by the church pastor or other church members.

Q253: In our congregation having bilingual Sabbath school classes or sermons in not acceptable.

Q254: Members of my congregation don't see much connection between faith and social issues.

Q255: The members of my congregation feel helping the poor is important in their lives.

Q256: The congregation contains several disruptive factions.

Q257: If a personal or family crisis were to occur, my pastor would be among the first people I would notify.

Q258: The pastor speaks English well.

Q259: Our pastor is concerned about meeting the needs of the youth of the church.

Q260: Our pastor gets along well with the youth of the church.

Q261: I enjoy listening to my pastor preach.

Q262: My pastor seems to have some influence in the community.

Q263: Do sermons in your congregation tie the teachings of faith to social problems and concerns in your neighborhood?

Q264: Have you heard your pastor say that being involved in social outreach can deepen one's faith?

Q265a (you): Indicate your work status.

Q265b (your spouse): Indicate your work status.

Q266a (you): How do you classify the work that you and your spouse (if any) do?

Q266b (your spouse): How do you classify the work that you and your spouse (if any) do?

Q267a (father): How do you classify the work that your father and mother do or did?

Q267b (mother): How do you classify the work that your father and mother do or did?

Please indicate which of the sources listed below had the greatest influence in your joining the Adventist church.

Q268: Church programs (prayer meetings, Sabbath school).

Q269: Church workers (pastor, colporteur, Bible worker).

Q270: An Adventist member whom you did not now, witnessing door-to-door.

Q271: A family member.

Q272: Adventist neighbor.

Q273: A friend.

Q274: Evangelism activity.

Q275: TV or Radio ministry.

Q276: Adventist schools.

Q277: SDA books, magazines or other publications.

Q278: Which statement below comes nearest to describing the type of fellowship you have found in the Adventist church? Mark only one answer.

Q279: How do you rate your present relationship to the church?

Q280: What is your citizenship status?

Q281: Which of the following statements comes closest to your views about abortion?

Q282: To what degree do you feel your religious beliefs and values guide or influence your voting decisions?

The following questions deal with your perceptions of your local church life.

Q283: I look forward every week to attending worship at my local church.

Q284: The worship service in my church is inspirational and spiritually uplifting.

Q285: I would characterize the sermons preached at my church as being Christ-centered.

Q286: More emphasis needs to be given to evangelism in my church.

Q287: The sermons in my church help me to relate my beliefs with problems and issues in today's world.

Q288: Worship services need to be more appealing to the youth of the church.

Q289: You have a voice in the decision making process of the church.

Q290: The church takes great care in organizing recreational and social activities for the youth of the church.

Q291: I could not see myself leaving the SDA church.

Q292: I would characterize my local congregation as one big family.

Q293: There is a lot of unity among the members of our church.

Q294: The church should seek to influence public officials (mayor, senators, etc.) on diverse social issues impacting the community.

Q295: How are important decisions made in your church?

Q296: (Answer only if you became an Adventist during your teens or later.) Since you conversion to Adventism, are you likely to be economically better or worse off?

Q297: How much financial support do you send to members of you immediate or extended family living in another country other that the U.S.?

Q298: How much financial support do you send to the Adventist church in another country other than the U.S.?

Q299 I have been motivated to further my education since becoming an Adventist.

Q300 My money doesn't seem to go far enough since becoming Adventist.

Q301 I have a better job now that I am an Adventist.

Q302: Now that I am a SDA, I am better off financially than my cousins of the same age who are not Adventists and live in the U.S..

APPENDIX B

CHAPTER III REGRESSION RESULTS

Dependent Variable – Standard of Living Index

Regress	Standard of Living	Gender	vce (robust)	Number of Observations	=	493
				F (1, X)	=	0.23
				Prob > F	=	0.6342
				R-squared	=	0.0005
				Root MSE	=	.87316

Standard of Living	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Gender	.0376182	.0789992	0.48	0.634	-.117599	.1928364
_cons	3.862252	.0529477	72.94	0.000	3.75822	3.966284

Regress	Standard of Living	Education Level	vce (robust)	Number of Observations	=	446
				F (1, X)	=	3.48
				Prob > F	=	0.0626
				R-squared	=	0.0079
				Root MSE	=	.86348

Standard of Living	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Education Level	.0654835	.0350825	1.87	0.063	-.0034648	.1344319
_cons	3.612353	.143304	25.21	0.000	3.330715	3.893992

Regress	Standard of Living	Age	vce (robust)	Number of Observations	=	506
				F (1, X)	=	6.92
				Prob > F	=	0.0088
				R-squared	=	0.0157
				Root MSE	=	.86429

Standard of Living	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Age	.0730534	.0277783	2.63	0.009	.0184779	.1276289
_cons	3.615802	.1104714	32.73	0.000	3.398761	3.832834

Regress	Standard of Living	Income	vce (robust)	Number of Observations	=	469
				F (1, X)	=	14.51
				Prob > F	=	0.0002
				R-squared	=	0.0302
				Root MSE	=	.84217

Standard of Living	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	.0847734	.0222574	3.81	0.000	.0410363	.1285105
_cons	3.597357	.0851436	42.25	0.000	3.430045	3.764669

Regress	Standard of Living	SDA	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.01
				Prob > F	=	0.9246
				R-squared	=	0.0000
				Root MSE	=	.87024

Standard of Living	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
SDA	-.0097046	.1025515	-0.09	0.925	-.2111935	.1917843
_cons	3.895725	.0428494	90.92	0.000	3.811536	3.979914

Regress	Standard of Living	Catholic	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.30
				Prob > F	=	0.5840
				R-squared	=	0.0006
				Root MSE	=	.86998

Standard of Living	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Catholic	.0425775	.0777153	0.55	0.584	.1101143	.1952692
_cons	3.873125	.0577042	67.12	0.000	3.75975	3.9865

Regress	Standard of Living	Protestant	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.12
				Prob > F	=	0.7335
				R-squared	=	0.0002
				Root MSE	=	.87015

Standard of Living	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Protestant	-.0424819	.1246991	-0.34	0.733	-.2874856	.2025218
_cons	3.898251	.041321	94.34	0.000	3.817065	3.979437

Regress	Standard of Living	No Religion	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.09
				Prob > F	=	0.7651
				R-squared	=	0.0002
				Root MSE	=	.87015

Standard of Living	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
No Religion	-.0306147	.1024084	-0.30	0.765	-.2318225	.1705932
_cons	3.900332	.0426626	91.42	0.000	3.81651	3.984153

Regress	Standard of Living	Catholic Protestant No Religion	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.12
				Prob > F	=	0.9503
				R-squared	=	0.0007
				Root MSE	=	.8717

Standard of Living	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Catholic	.0296821	.1069427	0.28	0.781	-.1804366	.2398008
Protestant	-.0302512	.1503808	-0.20	0.841	-.3257159	.2652136
No Religion	-.0163034	.1319786	-0.12	0.902	-.2756121	.2430053
_cons	3.88602	.0933589	41.62	0.000	3.702591	4.06945

Regress	Standard of Living	Commitment Index	vce (robust)	Number of Observations	=	507
				F (1, X)	=	39.84
				Prob > F	=	0.0000
				R-squared	=	0.0615
				Root MSE	=	.84703

Standard of Living	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Commitment Index	.3268987	.0517926	6.31	0.000	.2251431	.4286542
_cons	2.478918	.2186948	11.34	0.000	2.049254	2.908581

Dependent Variable - Health Index

Regress	Health Index	Gender	vce (robust)	Number of Observations	=	493
				F (1, X)	=	0.00
				Prob > F	=	0.9874
				R-squared	=	0.0000
				Root MSE	=	.86105

Health Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Gender	-.0012346	.0778483	-0.02	0.987	-.1541915	.1517223
_cons	3.957252	.0525024	75.37	0.000	3.854095	4.060409

Regress	Health Index	Education Level	vce (robust)	Number of Observations	=	446
				F (1, X)	=	2.91
				Prob > F	=	0.0888
				R-squared	=	0.0060
				Root MSE	=	.82749

Health Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Education Level	.0543916	.0318873	1.71	0.089	-.0082772	.1170604
_cons	3.778994	.1408411	26.83	0.000	3.502196	4.055792

Regress	Health Index	Age	vce (robust)	Number of Observations	=	506
				F (1, X)	=	0.49
				Prob > F	=	0.4858
				R-squared	=	0.0012
				Root MSE	=	.87327

Health Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Age	.0202257	.0289986	0.70	0.486	-.0367473	.0771986
_cons	3.863708	.1109181	34.83	0.000	3.645789	4.081627

Regress	Health Index	Income	vce (robust)	Number of Observations	=	469
				F (1, X)	=	0.61
				Prob > F	=	0.4360
				R-squared	=	0.0014
				Root MSE	=	.84249

Health Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	.0181929	.0233369	0.78	0.436	-.0276653	.0640512
_cons	3.905295	.0961567	40.61	0.000	3.716341	4.094248

Regress	Health Index	SDA	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.40
				Prob > F	=	0.5271
				R-squared	=	0.0008
				Root MSE	=	.86607

Health Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
SDA	.060125	.0950015	0.63	0.527	-.12653	.2467799
_cons	3.939875	.0436731	90.21	0.000	3.854068	4.025682

Regress	Health Index	Catholic	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.20
				Prob > F	=	0.6578
				R-squared	=	0.0004
				Root MSE	=	.86623

Health Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Catholic	.0343802	.0775667	0.44	0.658	-.1180196	.18678
_cons	3.935	.055295	71.16	0.000	3.826359	4.043641

Regress	Health Index	Protestant	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.24
				Prob > F	=	0.6280
				R-squared	=	0.0004
				Root MSE	=	.86621

Health Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Protestant	.0580036	.1196294	0.48	0.628	-.1770392	.2930464
_cons	3.94565	.0413178	95.50	0.000	3.864471	4.02683

Regress	Health Index	No Religion	vce (robust)	Number of Observations	=	498
				F (1, X)	=	1.90
				Prob > F	=	0.1687
				R-squared	=	0.0044
				Root MSE	=	.86448

Health Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
No Religion	-.1403552	.101829	-1.38	0.169	-.3404247	.0597142
_cons	3.981582	.0423678	93.98	0.000	3.898339	4.064824

Regress	Health Index	Commitment Index	vce (robust)	Number of Observations	=	507
				F (1, X)	=	39.59
				Prob > F	=	0.0000
				R-squared	=	0.0850
				Root MSE	=	.83585

Health Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Commitment Index	.384247	.0610708	6.29	0.000	.2642629	.5042311
_cons	2.289877	.2698862	8.48	0.000	1.4759639	2.820115

Dependent Variable - Education Index

Regress	Education Index	Gender	vce (robust)	Number of Observations	=	450
				F (1, X)	=	0.15
				Prob > F	=	0.7015
				R-squared	=	0.0003
				Root MSE	=	.98635

Education Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Gender	.0357143	.0931021	0.38	0.701	-.1472569	.2186854
_cons	4.183333	.06441432	65.22	0.000	4.057274	4.309392

Regress	Education Index	Education Level	vce (robust)	Number of Observations	=	403
				F (1, X)	=	1.30
				Prob > F	=	0.2548
				R-squared	=	0.0040
				Root MSE	=	1.0004

Education Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Education Level	.0537042	.0470915	1.14	0.255	-.0388729	.1462813
_cons	3.982863	.1865285	21.35	0.000	3.616167	4.349559

Regress	Education Index	Age	vce (robust)	Number of Observations	=	461
				F (1, X)	=	0.00
				Prob > F	=	0.9868
				R-squared	=	0.0000
				Root MSE	=	.98886

Education Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Age	-.0005073	.0307078	-0.02	0.987	-.0608527	.0598381
_cons	4.205796	.1285844	32.71	0.000	3.953109	4.458483

Regress	Education Index	Income	vce (robust)	Number of Observations	=	431
				F (1, X)	=	0.58
				Prob > F	=	0.4458
				R-squared	=	0.0014
				Root MSE	=	.99211

Education Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	-.0209092	.0274008	-0.76	0.446	-.0747657	.0329474
_cons	4.26954	.1011936	42.19	0.000	4.070643	4.468437

Regress	Education Index	SDA	vce (robust)	Number of Observations	=	453
				F (1, X)	=	2.16
				Prob > F	=	0.1423
				R-squared	=	0.0033
				Root MSE	=	.99228

Education Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
SDA	.1647966	.1121091	1.47	0.142	-.0555244	.3851177
_cons	4.173913	.0516583	80.80	0.000	4.072392	4.275434

Regress	Education Index	Catholic	vce (robust)	Number of Observations	=	453
				F (1, X)	=	1.95
				Prob > F	=	0.1635
				R-squared	=	0.0042
				Root MSE	=	.9918

Education Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Catholic	-.1288678	.0923245	-1.40	0.163	-.3103074	.0525718
_cons	4.263889	.0590485	72.21	0.000	4.147845	4.379933

Regress	Education Index	Protestant	vce (robust)	Number of Observations	=	453
				F (1, X)	=	0.25
				Prob > F	=	0.6147
				R-squared	=	0.0004
				Root MSE	=	.99368

Education Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Protestant	.0658472	.1307172	0.50	0.615	-.1910433	.3227377
_cons	4.189055	.0503349	83.22	0.000	4.090135	4.287975

Regress	Education Index	No Religion	vce (robust)	Number of Observations	=	453
				F (1, X)	=	0.11
				Prob > F	=	0.7416
				R-squared	=	0.0002
				Root MSE	=	.99379

Education Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
No Religion	.0347295	.10525	0.33	0.742	-.1721117	.2415708
_cons	4.188571	.0542969	77.14	0.000	4.081865	4.295278

Regress	Education Index	Commitment Index	vce (robust)	Number of Observations	=	462
				F (1, X)	=	59.57
				Prob > F	=	0.0000
				R-squared	=	0.1527
				Root MSE	=	.90986

Education Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Commitment Index	.5733998	.074295	7.72	0.000	.4274	.7193995
_cons	1.740133	.3337789	5.21	0.000	1.084212	2.396053

Dependent Variable - Commitment Index

Regress	Commitment Index	Gender	vce (robust)	Number of Observations	=	493
				F (1, X)	=	2.12
				Prob > F	=	0.1458
				R-squared	=	0.0043
				Root MSE	=	.65208

Commitment Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Gender	.0861969	.0591701	1.46	0.146	-.0300609	.2024548
_cons	4.258435	.0386307	110.23	0.000	4.182533	4.334337

Regress	Commitment Index	Education Level	vce (robust)	Number of Observations	=	446
				F (1, X)	=	3.29
				Prob > F	=	0.0703
				R-squared	=	0.0067
				Root MSE	=	.64243

Commitment Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Education Level	.0446931	.0246332	1.81	0.07	-.0037191	.0931053
_cons	4.136229	.1022581	40.45	0.000	3.935259	4.337199

Regress	Commitment Index	Age	vce (robust)	Number of Observations	=	506
				F (1, X)	=	2.55
				Prob > F	=	0.1111
				R-squared	=	0.0058
				Root MSE	=	.66159

Commitment Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Age	.0337596	.0211525	1.60	0.111	-.0077984	.0753176
_cons	4.169781	.0905661	46.04	0.000	3.991848	4.347715

Regress	Commitment Index	Income	vce (robust)	Number of Observations	=	469
				F (1, X)	=	0.36
				Prob > F	=	0.5499
				R-squared	=	0.0010
				Root MSE	=	.65968

Commitment Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	.0118007	.019722	0.60	0.550	-.0269541	.0505555
_cons	4.258821	.0735229	57.93	0.000	4.114344	4.403297

Regress	Commitment Index	SDA	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.19
				Prob > F	=	0.6669
				R-squared	=	0.0004
				Root MSE	=	.66341

Commitment Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
SDA	.0328821	.076347	0.43	0.667	-.1171213	.1828855
_cons	4.284975	.032941	130.08	0.000	4.220254	4.349696

Regress	Commitment Index	Catholic	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.02
				Prob > F	=	0.8762
				R-squared	=	0.0000
				Root MSE	=	.66352

Commitment Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Catholic	.0092452	.0593381	0.16	0.876	-.1073399	.1258303
_cons	4.286953	.0432582	99.10	0.000	4.201961	4.371945

Regress	Commitment Index	Protestant	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.39
				Prob > F	=	0.5306
				R-squared	=	0.0008
				Root MSE	=	.66327

Commitment Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Protestant	.0617308	.0983668	0.63	0.531	-.1315362	.2549978
_cons	4.285	.0313564	136.65	0.000	4.223392	4.346608

Regress	Commitment Index	No Religion	vce (robust)	Number of Observations	=	498
				F (1, X)	=	1.08
				Prob > F	=	0.2981
				R-squared	=	0.0024
				Root MSE	=	.66274

Commitment Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
No Religion	-.0792597	.0760926	-1.04	0.298	-.2287633	.0702439
_cons	4.308316	.032848	131.16	0.000	4.243778	4.372855

Dependent Variable – Development Index

Regress	Development Index	Gender	vce (robust)	Number of Observations	=	493
				F (1, X)	=	0.16
				Prob > F	=	0.6884
				R-squared	=	0.0003
				Root MSE	=	.62896

Development Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Gender	.0228132	.0568483	0.40	0.688	-.0888827	.1345091
_cons	3.995802	.0384342	103.96	0.000	3.920286	4.071317

Regress	Development Index	Education Level	vce (robust)	Number of Observations	=	446
				F (1, X)	=	4.52
				Prob > F	=	0.034
				R-squared	=	0.0101
				Root MSE	=	.63076

Development Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Education Level	.0539962	.0253954	2.13	0.034	.0040861	.1039064
_cons	3.798925	.1041978	36.46	0.000	3.594143	4.003708

Regress	Development Index	Age	vce (robust)	Number of Observations	=	506
				F (1, X)	=	2.41
				Prob > F	=	0.1214
				R-squared	=	0.0056
				Root MSE	=	.63412

Development Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Age	.0317798	.0204844	1.55	0.121	-.0084655	.0720251
_cons	3.885588	.0810823	47.92	0.000	3.726287	4.044889

Regress	Development Index	Income	vce (robust)	Number of Observations	=	469
				F (1, X)	=	2.66
				Prob > F	=	0.1034
				R-squared	=	0.0059
				Root MSE	=	.62119

Development Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	.0273264	.0167447	1.63	0.103	.0055779	.0602306
_cons	.3921324	.06466	60.65	0.000	3.794264	4.048385

Regress	Development Index	SDA	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.19
				Prob > F	=	0.6618
				R-squared	=	0.0004
				Root MSE	=	.63531

Development Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
SDA	.0305719	.0698526	0.44	0.662	-.1066715	.1678154
_cons	4.001775	.0320141	125.00	0.000	3.938875	4.064675

Regress	Development Index	Catholic	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.02
				Prob > F	=	0.8905
				R-squared	=	0.0000
				Root MSE	=	.63542

Development Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Catholic	-.0078412	.056949	-0.14	0.891	-.1197323	.1040498
_cons	4.011602	.0399634	100.38	0.000	3.933083	4.09012

Regress	Development Index	Protestant	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.11
				Prob > F	=	0.7357
				R-squared	=	0.0002
				Root MSE	=	.63537

Development Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Protestant	.0290928	.0861545	0.34	0.736	-.1401801	.1983656
_cons	4.004753	.0303694	131.87	0.000	3.945085	4.064422

Regress	Development Index	No Religion	vce (robust)	Number of Observations	=	498
				F (1, X)	=	0.21
				Prob > F	=	0.6505
				R-squared	=	0.0005
				Root MSE	=	.63528

Development Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
No Religion	-.0333885	.073653	-0.45	0.651	-.1780989	.1113218
_cons	4.014898	.0313555	128.04	0.000	3.953292	4.076504

Regress	Development Index	Commitment Index	vce (robust)	Number of Observations	=	507
				F (1, X)	=	132.79
				Prob > F	=	0.0000
				R-squared	=	0.1999
				Root MSE	=	.56824

Development Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Commitment Index	.4283461	.0371721	11.52	0.000	.355315	.5013772
_cons	2.163315	.1615727	13.39	0.000	1.845878	2.480753

Multivariate Regression Model 1

Regress	Standard of Living Index	Age Income Commitment Index	vce (robust)	Number of Observations	=	469
				F (1, X)	=	20.87
				Prob > F	=	0.0000
				R-squared	=	0.1044
				Root MSE	=	.81107

Standard of Living Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Age	.0398005	.0276399	1.44	0.151	-.0145141	.094115
Income	.0812318	.0211951	3.83	0.000	.0395817	.1228819
Commitment Index	.3333913	.0540107	6.17	0.000	.227256	.4395266
_cons	2.030633	.2422578	8.38	0.000	1.554577	2.506688

Multivariate Regression Model 2

Regress	Development Index	Education Level Commitment Index	vce (robust)	Number of Observations	=	446
				F (1, X)	=	71.19
				Prob > F	=	0.0000
				R-squared	=	0.2317
				Root MSE	=	.55632

Development Index	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Education Level	0.332334	.023797	1.40	0.163	-.0135357	.0800026
Commitment Index	.4645636	.0397644	11.68	0.000	.3864134	.5427139
_cons	1.877384	.1908294	9.84	0.000	1.502341	2.252427

APPENDIX C

CHAPTER IV REGRESSION RESULTS

Puerto Rico Regression Results

Regress	Church Membership	Income	vce (robust)	Number of Observations	=	59
				F (1, 57)	=	3.12
				Prob > F	=	0.0825
				R-squared	=	0.0725
				Root MSE	=	.04796

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	.4244227	.2401292	1.77	0.083	-.0564277	.9052732
_cons	.0180423	.0173387	1.04	0.302	-.0166778	.0527624

Regress	Church Membership	Income 1 lag	vce (robust)	Number of Observations	=	58
				F (1, 56)	=	10.63
				Prob > F	=	0.0019
				R-squared	=	0.1263
				Root MSE	=	.04694

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 1 lag	.5713793	.1752285	3.26	0.002	.220354	.9224042
_cons	.0081136	.0151837	0.53	0.595	-.0223031	.0385302

Regress	Church Membership	Income 2 lags	vce (robust)	Number of Observations	=	57
				F (1, 55)	=	23.21
				Prob > F	=	0.0000
				R-squared	=	0.1745
				Root MSE	=	.04602

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 2 lags	.68055	.1412741	4.82	0.000	.3974305	.9636696
_cons	.0002228	.0116155	0.02	0.985	-.0230552	.0235007

Regress	Church Membership	GDP	vce (robust)	Number of Observations	=	40
				F (1, 38)	=	6.36
				Prob > F	=	0.0160
				R-squared	=	0.1458
				Root MSE	=	.04502

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP	.7113073	.2820769	2.52	0.016	.1402725	1.282342
_cons	-.0112318	.0226509	-0.50	0.623	-.0570862	.0346226

Regress	Church Membership	GDP 1 lag	vce (robust)	Number of Observations	=	40
				F (1, 38)	=	8.42
				Prob > F	=	0.0061
				R-squared	=	0.1500
				Root MSE	=	.04455

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 1 lag	.716486	.2469014	2.90	0.006	.2166603	1.216312
_cons	-.0125248	.0196656	-0.64	0.528	-.0523358	.0272861

Regress	Church Membership	GDP 2 lags	vce (robust)	Number of Observations	=	40
				F (1, 38)	=	11.08
				Prob > F	=	0.0019
				R-squared	=	0.1726
				Root MSE	=	.04375

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 2 lags	.7674241	.2035829	3.33	0.002	.3006333	1.234215
_cons	-.0173375	.018173	-0.95	0.346	-.0541268	.0194518

Regress	Church Membership	Employment	vce (robust)	Number of Observations	=	31
				F (1, 29)	=	0.00
				Prob > F	=	0.9952
				R-squared	=	0.0000
				Root MSE	=	.02951

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment	.0012373	.203377	0.01	0.995	-.4147155	.41709
_cons	.0189648	.0079584	2.38	0.024	.0026882	.0352415

Regress	Church Membership	Employment 1 lag	vce (robust)	Number of Observations	=	30
				F (1, 28)	=	0.13
				Prob > F	=	0.7180
				R-squared	=	0.0031
				Root MSE	=	.02757

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 1 lag	-.0599678	.1643647	-0.36	0.718	-.3966537	.2767181
_cons	.0181756	.0060242	3.02	0.005	.0058355	.0305157

Regress	Church Membership	Employment 2 lags	vce (robust)	Number of Observations	=	29
				F (1, 27)	=	0.11
				Prob > F	=	0.7403
				R-squared	=	0.0014
				Root MSE	=	.02801

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 2 lags	-.0399477	.1192934	-0.33	0.740	-.2847176	.2048222
_cons	.0181929	.0064364	2.83	0.009	.0049865	.0313992

Regress	Tithe	Income	vce (robust)	Number of Observations	=	59
				F (1, 57)	=	13.10
				Prob > F	=	0.0006
				R-squared	=	0.1833
				Root MSE	=	.05649

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	.8614593	.2379725	3.62	0.001	.3849275	1.337991
_cons	-.0092919	.0171362	-0.54	0.590	-0436065	.0250227

Regress	Tithe	Income 1 lag	vce (robust)	Number of Observations	=	58
				F (1, 56)	=	0.31
				Prob > F	=	0.5794
				R-squared	=	0.0066
				Root MSE	=	.06304

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 1 lag	.1647608	.2955234	0.56	0.579	-.4272438	.7567653
_cons	.0381057	.0210737	1.81	0.076	-.0041099	.0803213

Regress	Tithe	Income 2 lags	vce (robust)	Number of Observations	=	57
				F (1, 55)	=	0.63
				Prob > F	=	0.4314
				R-squared	=	0.0133
				Root MSE	=	.0632

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 2 lags	-.2355616	.2972182	-0.79	0.431	-.8312002	.3600771
_cons	.0661977	.02021	3.28	0.002	.025696	.1066994

Regress	Tithe	GDP	vce (robust)	Number of Observations	=	40
				F (1, 38)	=	3.82
				Prob > F	=	0.0580
				R-squared	=	0.0835
				Root MSE	=	.05347

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP	.6171796	.3157966	1.95	0.058	-.0221171	1.256476
_cons	.0075962	.0255123	0.30	0.768	-.0440509	.0592432

Regress	Tithe	GDP 1 lag	vce (robust)	Number of Observations	=	40
				F (1, 38)	=	1.30
				Prob > F	=	0.2606
				R-squared	=	0.0283
				Root MSE	=	.05649

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 1 lag	.3691637	.3232632	1.14	0.261	-.2852485	1.023576
_cons	.0256746	.0247591	1.04	0.306	-.0244476	.0757968

Regress	Tithe	GDP 2 lags	vce (robust)	Number of Observations	=	40
				F (1, 38)	=	0.02
				Prob > F	=	0.8974
				R-squared	=	0.0004
				Root MSE	=	.05842

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 2 lags	-.0459624	.3540547	-0.13	0.897	-.7627086	.6707839
_cons	.0567286	.0245654	2.31	0.026	.0069984	.1064587

Regress	Tithe	Employment	vce (robust)	Number of Observations	=	31
				F (1, 29)	=	0.99
				Prob > F	=	0.3270
				R-squared	=	0.0388
				Root MSE	=	.04629

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment	.3554586	.3564997	1.00	0.327	-.3736652	1.084582
_cons	.031258	.0124579	2.51	0.018	.0057788	.0567372

Regress	Tithe	Employment 1 lag	vce (robust)	Number of Observations	=	30
				F (1, 28)	=	11.61
				Prob > F	=	0.0020
				R-squared	=	0.1819
				Root MSE	=	.04338

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 1 lag	.7937841	.2329663	3.41	0.002	.3165743	1.270994
_cons	.0223413	.0103287	2.16	0.039	.001184	.0434986

Regress	Tithe	Employment 2 lags	vce (robust)	Number of Observations	=	29
				F (1, 27)	=	1.88
				Prob > F	=	0.1812
				R-squared	=	0.0505
				Root MSE	=	.04706

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 2 lags	.4153452	.3026226	1.37	0.181	-.2055851	1.036275
_cons	.0286638	.0119874	2.39	0.024	.0040678	.0532599

Regress	Baptisms	Income	vce (robust)	Number of Observations	=	59
				F (1, 57)	=	7.28
				Prob > F	=	0.0091
				R-squared	=	0.0986
				Root MSE	=	.04197

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	.4396093	.1629001	2.70	0.009	.1134075	.7658111
_cons	.0713744	.0124984	5.71	0.000	.0463468	.0964019

Regress	Baptisms	Income 1 lag	vce (robust)	Number of Observations	=	58
				F (1, 56)	=	4.46
				Prob > F	=	0.0391
				R-squared	=	0.0745
				Root MSE	=	.04287

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 1 lag	.3894541	.1843452	2.11	0.039	.0201663	.7587418
_cons	.0744839	.0169396	4.40	0.000	.0405498	.1084179

Regress	Baptisms	Income 2 lags	vce (robust)	Number of Observations	=	57
				F (1, 55)	=	33.85
				Prob > F	=	0.0000
				R-squared	=	0.2686
				Root MSE	=	.03023

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 2 lags	.5893121	.1012874	5.82	0.000	.3863276	.7922967
_cons	.0570174	.0080771	7.06	0.000	.0408305	.0732043

Regress	Baptisms	GDP	vce (robust)	Number of Observations	=	40
				F (1, 38)	=	4.94
				Prob > F	=	0.0323
				R-squared	=	0.1170
				Root MSE	=	.03164

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP	.4403926	.16981582	2.22	0.032	.0392424	.8415429
_cons	.061914	.01751	3.54	0.001	.0264668	.0973613

Regress	Baptisms	GDP 1 lag	vce (robust)	Number of Observations	=	40
				F (1, 38)	=	7.96
				Prob > F	=	0.0075
				R-squared	=	0.1411
				Root MSE	=	.03176

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 1 lag	.4926554	.174568	2.82	0.008	.139261	.8460498
_cons	.0565192	.0147482	3.83	0.000	.026663	.0863754

Regress	Baptisms	GDP 2 lags	vce (robust)	Number of Observations	=	40
				F (1, 38)	=	10.19
				Prob > F	=	0.0028
				R-squared	=	0.2081
				Root MSE	=	.0345

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 2 lags	.5996444	.1878689	3.19	0.003	.2193237	.9799651
_cons	.047135	.0142503	3.31	0.002	.0182869	.0759832

Regress	Baptisms	Employment	vce (robust)	Number of Observations	=	31
				F (1, 29)	=	0.02
				Prob > F	=	0.8877
				R-squared	=	0.0009
				Root MSE	=	.02353

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment	-.0269652	.189213	-0.14	0.888	-.4139492	.3600188
_cons	.0754469	.0069418	10.87	0.000	.0612494	.0896444

Regress	Baptisms	Employment 1 lag	vce (robust)	Number of Observations	=	30
				F (1, 28)	=	0.00
				Prob > F	=	0.9553
				R-squared	=	0.0001
				Root MSE	=	.02147

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 1 lag	-.0084754	.1498813	-0.06	0.955	-.3154933	.2985426
_cons	.0732521	.0061452	11.92	0.000	.0606642	.08584

Regress	Baptisms	Employment 2 lags	vce (robust)	Number of Observations	=	29
				F (1, 27)	=	0.02
				Prob > F	=	0.8965
				R-squared	=	0.0003
				Root MSE	=	.02117

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 2 lags	-.0131472	.1001474	-0.13	0.897	-.2186327	.1923383
_cons	.072395	.0050796	14.25	0.000	.0619726	.0828174

Regress	Membership	Income 2 lags	vce (robust)	Number of Observations	=	40
		GDP 2 lags		F (2, 37)	=	16.22
				Prob > F	=	0.0000
				R-squared	=	0.2995
				Root MSE	=	.04079

Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 2 lags	.6825663	.1943332	3.51	0.001	.2888098	1.076323
GDP 2 lags	.4785933	.2261811	2.12	0.041	.0203069	.9368796
_cons	-.0438144	.0166886	-2.63	0.013	-.0776288	-.01

Regress	Tithe	Income Employment 1 lag	vce (robust)	Number of Observations	=	30
				F (2, 27)	=	6.61
				Prob > F	=	0.0046
				R-squared	=	0.2421
				Root MSE	=	.04252

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	.6156623	.4318555	1.43	0.165	-.270432	1.501756
Employment 1 lag	.5401985	.2857742	1.89	0.069	-.0461618	1.126559
_cons	-.0059982	.0222006	-0.27	0.789	-.05155	.0395536

Regress	Baptisms	Income 2 lags GDP 2 lags	vce (robust)	Number of Observations	=	40
				F (2, 27)	=	21.68
				Prob > F	=	0.0000
				R-squared	=	0.4612
				Root MSE	=	.02546

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 2 lags	.6859305	.1656727	4.14	0.000	.3502457	1.021615
GDP 2 lags	.30939	.1990305	1.55	0.129	-.0938841	.7126642
_cons	.0205276	.0136506	1.50	0.141	-.0071311	.0481863

Hawai'i Regression Results

Regress	Church Membership	Income	vce (robust)	Number of Observations	=	38
				F (1, 36)	=	1.59
				Prob > F	=	0.2150
				R-squared	=	0.0349
				Root MSE	=	.0272

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	.160688	.1273225	1.26	0.215	-.097534	.4189099
_cons	.0118047	.0082879	1.42	0.163	-.0050039	.0286134

Regress	Church Membership	Income 1 lag	vce (robust)	Number of Observations	=	37
				F (1, 35)	=	2.09
				Prob > F	=	0.1567
				R-squared	=	0.0396
				Root MSE	=	.02746

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 1 lag	.1708425	.1180345	1.45	0.157	-.0687803	.4104653
_cons	.0109145	.0084977	1.28	0.207	-.0063369	.0281658

Regress	Church Membership	Income 2 lags	vce (robust)	Number of Observations	=	36
				F (1, 34)	=	1.33
				Prob > F	=	0.2574
				R-squared	=	0.0395
				Root MSE	=	.02771

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 2 lags	.1702797	.147818	1.15	0.257	-.1301227	.4706821
_cons	.010545	.0092256	1.14	0.261	-.0082035	.0292936

Regress	Church Membership	GDP	vce (robust)	Number of Observations	=	32
				F (1, 30)	=	1.38
				Prob > F	=	0.2491
				R-squared	=	0.0309
				Root MSE	=	.02565

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP	.1097123	.0933418	1.18	0.249	-.080917	.3003416
_cons	.0152914	.0089661	1.71	0.098	-.0030197	.0336025

Regress	Church Membership	GDP 1 lag	vce (robust)	Number of Observations	=	33
				F (1, 31)	=	0.90
				Prob > F	=	0.3488
				R-squared	=	0.0224
				Root MSE	=	.02559

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 1 lag	.0939736	.0987893	0.95	0.349	-.1075085	.2954557
_cons	.0171762	.0082111	2.09	0.045	.0004295	.0339228

Regress	Church Membership	GDP 2 lags	vce (robust)	Number of Observations	=	34
				F (1, 32)	=	2.35
				Prob > F	=	0.1348
				R-squared	=	0.0569
				Root MSE	=	.02597

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 2 lags	.1571478	.102435	1.53	0.135	-.0515055	.3658012
_cons	.0103849	.0097324	1.07	0.294	-.0094393	.0302091

Regress	Church Membership	Employment	vce (robust)	Number of Observations	=	45
				F (1, 43)	=	0.16
				Prob > F	=	0.6928
				R-squared	=	0.0023
				Root MSE	=	.02625

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment	.0583913	.146837	0.40	0.693	-.2377737	.3545163
_cons	.0188701	.0051592	3.66	0.001	.0084655	.0292747

Regress	Church Membership	Employment 1 lag	vce (robust)	Number of Observations	=	45
				F (1, 43)	=	0.00
				Prob > F	=	0.9682
				R-squared	=	0.0000
				Root MSE	=	.02628

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 1 lag	.0058212	.1453985	0.04	0.968	-.2874028	.2990451
_cons	.0201739	.0057795	3.49	0.001	.0085184	.0318295

Regress	Church Membership	Employment 2 lags	vce (robust)	Number of Observations	=	45
				F (1, 43)	=	0.46
				Prob > F	=	0.5032
				R-squared	=	0.0065
				Root MSE	=	.02619

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 2 lags	.0891459	.1320361	0.68	0.503	-.1771303	.3554221
_cons	.0177651	.0055152	3.22	0.002	.0066426	.0288875

Regress	Tithe	Income	vce (robust)	Number of Observations	=	38
				F (1, 36)	=	2.11
				Prob > F	=	0.1548
				R-squared	=	0.0584
				Root MSE	=	.04292

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	.3321002	.2285245	1.45	0.155	-.1313691	.7955695
_cons	.0213383	.0160456	1.33	0.192	-.0112037	.0538804

Regress	Tithe	Income 1 lag	vce (robust)	Number of Observations	=	37
				F (1, 35)	=	0.49
				Prob > F	=	0.4872
				R-squared	=	0.0148
				Root MSE	=	.04433

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 1 lag	.1664538	.2370235	0.70	0.487	-.3147294	.647637
_cons	.0306446	.0179084	1.71	0.096	-.0057115	.0670007

Regress	Tithe	Income 2 lags	vce (robust)	Number of Observations	=	36
				F (1, 34)	=	0.16
				Prob > F	=	0.6960
				R-squared	=	0.0042
				Root MSE	=	.04485

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 2 lags	.0887772	.2252878	0.39	0.696	-.3690626	.5466171
_cons	.0344232	.0173389	1.99	0.055	-.0008138	.0696601

Regress	Tithe	GDP	vce (robust)	Number of Observations	=	32
				F (1, 30)	=	5.34
				Prob > F	=	0.0278
				R-squared	=	0.1908
				Root MSE	=	.03895

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP	.4532828	.196069	2.31	0.028	.0528565	.8537091
_cons	.0072281	.0191322	0.38	0.708	-.0318451	.0463012

Regress	Tithe	GDP 1 lag	vce (robust)	Number of Observations	=	33
				F (1, 31)	=	1.44
				Prob > F	=	0.2390
				R-squared	=	0.0557
				Root MSE	=	.04142

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 1 lag	.244109	.2033442	1.20	0.239	-.1706144	.6588323
_cons	.0245956	.0191071	1.29	0.208	-.0143735	.0635647

Regress	Tithe	GDP 2 lags	vce (robust)	Number of Observations	=	34
				F (1, 32)	=	0.57
				Prob > F	=	0.4542
				R-squared	=	0.0190
				Root MSE	=	.04243

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 2 lags	.1454378	.1919616	0.76	0.454	-.2455751	.5364508
_cons	.0345166	.020339	1.70	0.099	-.0069126	.0759459

Regress	Tithe	Employment	vce (robust)	Number of Observations	=	45
				F (1, 43)	=	3.81
				Prob > F	=	0.0574
				R-squared	=	0.0772
				Root MSE	=	.04271

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment	.5706961	.2922769	1.95	0.057	-.0187364	1.160129
_cons	.0299134	.0100497	2.98	0.005	.0096462	.0501806

Regress	Tithe	Employment 1 lag	vce (robust)	Number of Observations	=	45
				F (1, 43)	=	2.69
				Prob > F	=	0.1081
				R-squared	=	0.0666
				Root MSE	=	.04296

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 1 lag	.5020947	.3059569	1.64	0.108	-.1149261	1.119115
_cons	.0306563	.0105817	2.90	0.006	.0093163	.0519962

Regress	Tithe	Employment 2 lags	vce (robust)	Number of Observations	=	45
				F (1, 27)	=	1.33
				Prob > F	=	0.2548
				R-squared	=	0.0321
				Root MSE	=	.04374

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 2 lags	.3345551	.28984	1.15	0.255	-.2499629	.9190731
_cons	.034561	.0110211	3.14	0.003	.0123348	.0567871

Regress	Baptisms	Income	vce (robust)	Number of Observations	=	38
				F (1, 36)	=	9.75
				Prob > F	=	0.0035
				R-squared	=	0.1438
				Root MSE	=	.01847

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	.2353044	.0753683	3.12	0.004	.0824503	.3881585
_cons	.0377488	.004564	8.27	0.000	.0284925	.0470052

Regress	Baptisms	Income 1 lag	vce (robust)	Number of Observations	=	37
				F (1, 35)	=	8.84
				Prob > F	=	0.0053
				R-squared	=	0.1123
				Root MSE	=	.01885

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 1 lag	.2054808	.0690925	2.97	0.005	.0652156	.3457459
_cons	.0390664	.0044464	8.79	0.000	.0300398	.0480931

Regress	Baptisms	Income 2 lags	vce (robust)	Number of Observations	=	36
				F (1, 34)	=	12.49
				Prob > F	=	0.0012
				R-squared	=	0.1960
				Root MSE	=	.01819

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 2 lags	.2722325	.0770239	3.53	0.001	.1157012	.4287639
_cons	.035063	.0048968	7.16	0.000	.0251114	.0450145

Regress	Baptisms	GDP	vce (robust)	Number of Observations	=	33
				F (1, 31)	=	5.40
				Prob > F	=	0.0268
				R-squared	=	0.1250
				Root MSE	=	.01723

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP	.1579621	.0679508	2.32	0.027	.0193756	.2965486
_cons	.0439025	.0063374	6.93	0.000	.0309772	.0568278

Regress	Baptisms	GDP 1 lag	vce (robust)	Number of Observations	=	34
				F (1, 32)	=	6.30
				Prob > F	=	0.0173
				R-squared	=	0.1286
				Root MSE	=	.01693

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 1 lag	.1602768	.0638615	2.51	0.017	.0301952	.2903584
_cons	.0436235	.0057542	7.58	0.000	.0319025	.0553445

Regress	Baptisms	GDP 2 lags	vce (robust)	Number of Observations	=	34
				F (1, 32)	=	9.78
				Prob > F	=	0.0037
				R-squared	=	0.1620
				Root MSE	=	.0169

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 2 lags	.1831529	.058575	3.13	0.004	.0638397	.3024662
_cons	.0406826	.0052027	7.82	0.000	.0300851	.0512802

Regress	Baptisms	Employment	vce (robust)	Number of Observations	=	48
				F (1, 46)	=	3.64
				Prob > F	=	0.0628
				R-squared	=	0.0375
				Root MSE	=	.01819

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment	.154097	.0807987	1.91	0.063	-.0085423	.3167364
_cons	.0496066	.0037573	13.20	0.000	.0420435	.0571697

Regress	Baptisms	Employment 1 lag	vce (robust)	Number of Observations	=	47
				F (1, 45)	=	1.75
				Prob > F	=	0.1925
				R-squared	=	0.0240
				Root MSE	=	.01845

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 1 lag	.1232203	.0931379	1.32	0.193	-.0643692	.3108097
_cons	.0501477	.0038381	13.07	0.000	.0424173	.057878

Regress	Baptisms	Employment 2 lags	vce (robust)	Number of Observations	=	46
				F (1, 44)	=	9.40
				Prob > F	=	0.0037
				R-squared	=	0.0890
				Root MSE	=	.01801

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 2 lags	.2387702	.0778743	3.07	0.004	.0818249	.3957155
_cons	.0466688	.0033157	14.08	0.000	.0399865	.0533511

Regress	Baptisms	Income 2 lags GDP 2 lags Employment 2 lags	vce (robust)	Number of Observations	=	28
				F (3, 24)	=	3.43
				Prob > F	=	0.0031
				R-squared	=	0.2187
				Root MSE	=	.01829

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 2 lags	.1816187	.1795392	1.01	0.322	-.1889321	.5521695
GDP 2 lags	.1161687	.158808	0.73	0.472	-.2115948	.4439322
Employment 2 lags	-.1005836	.2319955	-0.43	0.668	-.5793988	.3782315
_cons	.0371606	.0065619	5.66	0.000	.0236175	.0507037

Jamaica Regression Results

Regress	Church Membership	Income	vce (robust)	Number of Observations	=	39
				F (1, 37)	=	0.03
				Prob > F	=	0.8626
				R-squared	=	0.0003
				Root MSE	=	.04471

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	-.0071177	.040844	-0.17	0.863	-.0898754	.0756401
_cons	.042309	.0064345	6.58	0.000	.0292714	.0553465

Regress	Church Membership	Income 1 lag	vce (robust)	Number of Observations	=	38
				F (1, 36)	=	0.05
				Prob > F	=	0.8239
				R-squared	=	0.0004
				Root MSE	=	.04515

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 1 lag	-.0090342	.0403111	-0.22	0.824	-.0907889	.0727206
_cons	.0417888	.0059354	7.04	0.000	.0297512	.0538263

Regress	Church Membership	Income 2 lags	vce (robust)	Number of Observations	=	37
				F (1, 35)	=	0.59
				Prob > F	=	0.4468
				R-squared	=	0.0138
				Root MSE	=	.04486

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 2 lags	-.0518852	.0674294	-0.77	0.447	-.1887741	.0850037
_cons	.0430424	.0046449	9.27	0.000	.0336127	.0524722

Regress	Church Membership	GDP	vce (robust)	Number of Observations	=	45
				F (1, 43)	=	1.02
				Prob > F	=	0.3179
				R-squared	=	0.0072
				Root MSE	=	.0426

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP	-.0281521	.0278594	-1.01	0.318	-.084336	.0280317
_cons	.0445521	.0053292	8.36	0.000	.0338048	.0552995

Regress	Church Membership	GDP 1 lag	vce (robust)	Number of Observations	=	44
				F (1, 42)	=	0.04
				Prob > F	=	0.8359
				R-squared	=	0.0003
				Root MSE	=	.04318

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 1 lag	-.005263	.0252452	-0.21	0.836	-.0562098	.0456839
_cons	.0435494	.0057858	7.53	0.000	.0318732	.0552255

Regress	Church Membership	GDP 2 lags	vce (robust)	Number of Observations	=	43
				F (1, 41)	=	0.27
				Prob > F	=	0.6067
				R-squared	=	0.0033
				Root MSE	=	.04327

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 2 lags	-.0189249	.0364823	-0.52	0.607	-.0926025	.0547527
_cons	.045215	.0050796	8.90	0.000	.0349564	.0554735

Regress	Church Membership	Employment	vce (robust)	Number of Observations	=	27
				F (1, 25)	=	1.63
				Prob > F	=	0.2133
				R-squared	=	0.0527
				Root MSE	=	.04801

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment	.8185592	.6408825	1.28	0.213	-.501363	2.138481
_cons	.0237392	.0141046	1.68	0.105	-.0053097	.0527881

Regress	Church Membership	Employment 1 lag	vce (robust)	Number of Observations	=	26
				F (1, 24)	=	2.24
				Prob > F	=	0.1472
				R-squared	=	0.0909
				Root MSE	=	.04798

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 1 lag	1.079411	.7205448	1.50	0.147	-.4077208	2.566542
_cons	.0210304	.0142486	1.48	0.153	-.0083772	.050438

Regress	Church Membership	Employment 2 lags	vce (robust)	Number of Observations	=	25
				F (1, 23)	=	0.00
				Prob > F	=	0.9610
				R-squared	=	0.0002
				Root MSE	=	.0514

Church Membership	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 2 lags	-.0506031	1.024055	-0.05	0.961	-2.169023	2.067817
_cons	.030734	.0154551	1.99	0.059	-.0012372	.0627053

Regress	Tithe	Income	vce (robust)	Number of Observations	=	34
				F (1, 32)	=	5.47
				Prob > F	=	0.0257
				R-squared	=	0.1499
				Root MSE	=	.18022

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	.7949509	.3397526	2.34	0.026	.1028974	1.487004
_cons	.0078545	.0387509	0.20	0.841	-.0710785	.0867876

Regress	Tithe	Income 1 lag	vce (robust)	Number of Observations	=	33
				F (1, 31)	=	0.01
				Prob > F	=	0.9125
				R-squared	=	0.0003
				Root MSE	=	.19857

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 1 lag	-.0332399	.300198	-0.11	0.913	-.64549780	.5790179
_cons	.0615224	.039175	1.57	0.126	-.0183756	.1414204

Regress	Tithe	Income 2 lags	vce (robust)	Number of Observations	=	32
				F (1, 30)	=	0.48
				Prob > F	=	0.4917
				R-squared	=	0.0117
				Root MSE	=	.20069

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 2 lags	.219445	.3152242	0.70	0.492	-.4243288	.8632188
_cons	.044752	.0317262	1.41	0.169	-.0200415	.1095455

Regress	Tithe	GDP	vce (robust)	Number of Observations	=	40
				F (1, 38)	=	21.61
				Prob > F	=	0.0000
				R-squared	=	0.4485
				Root MSE	=	.13416

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP	1.020757	.2196028	4.65	0.000	.5761946	1.46532
_cons	-.0138533	.0251712	-0.55	0.585	-.0648097	.037103

Regress	Tithe	GDP 1 lag	vce (robust)	Number of Observations	=	39
				F (1, 37)	=	0.01
				Prob > F	=	0.9409
				R-squared	=	0.0001
				Root MSE	=	.18304

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 1 lag	-.0149506	.2002358	-0.07	0.941	-.4206669	.3907657
_cons	.0556816	.0334648	1.66	0.105	-.0121246	.1234878

Regress	Tithe	GDP 2 lags	vce (robust)	Number of Observations	=	38
				F (1, 36)	=	1.21
				Prob > F	=	0.2788
				R-squared	=	0.0358
				Root MSE	=	.18216

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 2 lags	.2682395	.243922	1.10	0.279	-.2264572	.7629362
_cons	.0352768	.0329887	1.07	0.292	.0316273	.1021809

Regress	Tithe	Employment	vce (robust)	Number of Observations	=	23
				F (1, 21)	=	1.26
				Prob > F	=	0.2741
				R-squared	=	0.0720
				Root MSE	=	.18944

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment	-4.239659	3.775229	-1.12	0.274	12.09068	.30611361
_cons	.1119879	.060767	1.84	0.080	-.0143841	.2383598

Regress	Tithe	Employment 1 lag	vce (robust)	Number of Observations	=	23
				F (1, 21)	=	0.23
				Prob > F	=	0.6392
				R-squared	=	0.0064
				Root MSE	=	.19602

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 1 lag	1.270182	2.670343	0.48	0.639	-4.283101	6.823465
_cons	.0637301	.0540025	1.18	0.251	-.0485743	.1760345

Regress	Tithe	Employment 2 lags	vce (robust)	Number of Observations	=	23
				F (1, 21)	=	0.98
				Prob > F	=	0.3343
				R-squared	=	0.0827
				Root MSE	=	.18835

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 2 lags	-4.580502	4.635393	-0.99	0.334	-14.22033	5.059327
_cons	.114577	.0574515	1.99	0.059	-.0048999	.234054

Regress	Baptisms	Income	vce (robust)	Number of Observations	=	39
				F (1, 37)	=	0.21
				Prob > F	=	0.6487
				R-squared	=	0.0051
				Root MSE	=	.01717

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	.0123067	.0267957	0.46	0.649	-.0419865	.0665999
_cons	.066892	.0031404	21.30	0.000	.0605289	.0732551

Regress	Baptisms	Income 1 lag	vce (robust)	Number of Observations	=	38
				F (1, 36)	=	1.48
				Prob > F	=	0.2318
				R-squared	=	0.0210
				Root MSE	=	.01662

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 1 lag	.0241287	.0198365	1.22	0.232	.0161016	.0643591
_cons	.0654736	.0028943	22.62	0.000	.0596037	.0713436

Regress	Baptisms	Income 2 lags	vce (robust)	Number of Observations	=	37
				F (1, 35)	=	1.28
				Prob > F	=	0.2655
				R-squared	=	0.0155
				Root MSE	=	.01582

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income 2 lags	0194009	.017146	1.13	0.266	-.0154074	.0542092
_cons	.0648081	.0025469	25.45	0.000	.0596376	.0699786

Regress	Baptisms	GDP	vce (robust)	Number of Observations	=	46
				F (1, 44)	=	0.20
				Prob > F	=	0.6582
				R-squared	=	0.0022
				Root MSE	=	.01797

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP	-.0066743	.0149844	-0.45	0.658	-.0368732	.0235247
_cons	.0711547	.0027531	25.85	0.000	.0656061	.0767032

Regress	Baptisms	GDP 1 lag	vce (robust)	Number of Observations	=	45
				F (1, 43)	=	0.25
				Prob > F	=	0.6178
				R-squared	=	0.0039
				Root MSE	=	.01805

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 1 lag	.0087767	.0174642	0.50	0.618	-.0264433	.0439966
_cons	.0699286	.002955	23.66	0.000	.0639693	.0758879

Regress	Baptisms	GDP 2 lags	vce (robust)	Number of Observations	=	44
				F (1, 42)	=	1.10
				Prob > F	=	0.3009
				R-squared	=	0.0197
				Root MSE	=	.01741

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
GDP 2 lags	.0189667	.0181078	1.05	0.301	-.0175762	.0555097
_cons	.0685658	.0028096	24.40	0.000	.0628958	.0742358

Regress	Baptisms	Employment	vce (robust)	Number of Observations	=	27
				F (1, 25)	=	0.16
				Prob > F	=	0.6951
				R-squared	=	0.0044
				Root MSE	=	.01268

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment	-.060745	.1532008	-0.40	0.695	-.3762678	.2547779
_cons	.0604266	.0030484	19.82	0.000	.0541482	.066705

Regress	Baptisms	Employment 1 lag	vce (robust)	Number of Observations	=	26
				F (1, 24)	=	0.00
				Prob > F	=	0.9639
				R-squared	=	0.0000
				Root MSE	=	.01295

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 1 lag	-.0045262	.099063	-0.05	0.964	-.2089822	.1999299
_cons	.0598538	.0027899	21.45	0.000	.0540958	.0656118

Regress	Baptisms	Employment 2 lags	vce (robust)	Number of Observations	=	25
				F (1, 23)	=	1.52
				Prob > F	=	0.2298
				R-squared	=	0.0621
				Root MSE	=	.01271

Baptisms	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Employment 2 lags	-.2286529	.1853388	-1.23	0.230	-.6120553	.1547495
_cons	.0613865	.0034937	17.57	0.000	.0541593	.0686138

Regress	Tithe	Income	vce (robust)	Number of Observations	=	34
		GDP		F (2, 31)	=	10.08
				Prob > F	=	0.0004
				R-squared	=	0.4529
				Root MSE	=	.14689

Tithe	Coefficient	Robust Standard Error	t	P>|t|	[95% Confidence Interval]	
Income	-.140621	.4189444	-0.34	0.739	-.9950638	.7138218
GDP	1.107681	.329042	3.37	0.002	.4365959	1.778767
_cons	-.0129835	.032055	-0.41	0.688	-.07836	.052393

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